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TEMPLE BAR 2468 JUNE 9 1956 VOLUME 99 NUMBER 2606

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REPORT FROM THE EDITOR

Gerald Pawle (right) on war service in the Mediterranean

IN May, 1953, Gerald Pawle, a Fleet Street journalist specializing in defence affairs, and a former international squash player, was invited to the first reunion dinner of the Wheezers and Dodgers—the Royal Navy's wartime inventing team. He accepted, and earned himself two and a half years of hard work. For he was asked to write the history of their fantastic exploits (page 11).

Pawle began the job the following September when he went to live in Cornwall. He wrote to Nevil Shute Norway—Nevil Shute, the novelist—in Australia. Pawle had worked under Norway, who is a brilliant engineer, in the Wheezers and Dodgers.

Norway's reply was typically humorous and dynamic. He had just returned from a "wild and woolly" trip in Western Australia to obtain material for *Beyond The Black Stump*, recently serialized in JOHN BULL. Now he was going to Oregon for a pack-mule expedition, and he suggested that Pawle should take a tramp steamer from Falmouth—just across the bay from his home—and meet him in Oregon to discuss the Wheezers and Dodgers.

Pawle could not accept, for he had begun a 15,000-mile interviewing tour in Britain. But he exchanged many letters with Norway, and met him in this country later.

Before he began his final text Pawle collected nine hundred typewritten sheets of notes. Lady Mary Pawle, his wife, grew accustomed to inventors arriving unexpectedly to talk to her husband.

Most of the men Pawle interviewed now occupy important posts in the universities, in industry and in scientific research. But some are still as harum-scarum as they were during their wartime heyday. One man is still inventing weapons. He told Pawle that the day before he had conducted trials with a useful new device.

"Unfortunately," says Pawle, "his range-finding had been at fault. He had demolished his own summer-house—while his wife was knitting inside."

LADY BARNETT, who introduces this week's supplement, says that it is not always ideal for a man and wife to be equally interested in the home. "There may be serious clashes." At the Barnetts' home—a ten-room Georgian house situated in a quiet Leicestershire village—the danger is avoided. Decisions about the home are left to Lady Barnett.

But one difference of opinion concerned a few thousand homes. When Sir Geoffrey was chairman of Leicester's housing committee, his wife held a similar post for a neighbouring local council. "My husband wanted to grab half our land for houses, and I decided to fight him tooth and nail," she says. The verbal battle went on in the council chambers and in the Barnetts' home. It was another triumph for Lady Barnett.

Good oh!

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GET IT TO-DAY

Free Speech

- **Sardine-tin travel in the cities**
- **Do football clubs play fair with fans?**
- **Helping the arts to pay the bill**

WHAT a hell on earth most people in London and other crowded cities have to endure as they travel to and from their work!

I have just returned from a three-month study course in the capital, and I lived in a southern suburb. The travel conditions were indescribable: twenty-five people often crammed into a railway compartment built for ten, and one elderly woman told me that in three years of travelling she had never once had a seat. She pays £1 a week to endure overcrowding that would not be tolerated for cattle.

Staggered business hours have proved a failure. If town life is not to grind to a halt within a few years, firms must quickly decide to abandon the cities and move to outlying districts.—DAVID GOODSELL, Ripon, Yorkshire.

Full Lives

An energetic, ambitious man could no more live happily without the excitement and inner satisfaction to be gained from "living" his job ("Free Speech," May 19) than the plodder could without the pleasure derived from his hobbies. Both lead a full and happy life but, if anything, the scales tip in the former's favour—because he spends more time doing what he likes best.—G. DAVIS, Colson Path, Loughton, Essex.

Playing Safe?

Before next season, the Football Association should work out some scheme whereby football spectators get part of their money back when a game is abandoned. If they don't do so, they are profiting while the poor fan gets short measure. Supporters should at least be handed tickets for the replay.—I. RACE, Sheffield, 5.

"There is a case for issuing tickets for the replay if the ball has not been kicked off," says the Football Association, "but this is for indivdual clubs to decide. Most clubs have notices at the gate saying 'No money returned in any circumstances,' so people are aware of the position before they pay to go in."

Creature Comfort

Your correspondent who asks to whom we are most indebted, the "grand old folk" or the "howling mongrel" and "mewing cat" ("Free Speech," May 19) overlooks the fact that these animals are often old people's dearest and only friends. Were it not for animal welfare organizations they would be unable to tend and care for their pets, particularly when sick. Many of these organizations supply medicine and carry out operations on pets free of charge.

Old folk are looked after now better than they have ever been, and most of them have someone who cares about them. But animals are helpless if anything goes wrong and obviously cannot complain like human beings.

A well-trained and well-loved pet is far superior to man with his infidelity and selfishness.—MRS. E. THOMSON, Edgbaston, Birmingham, 15.

Lightning Tour

During a recent visit to Denmark, I had occasion to comment on the speed of the traffic in Copenhagen. "There is no speed limit here," replied my Danish friend. "We rely on the sense of social responsibility of our motorists."—A. G., Aberdeen.

Denmark is the only country in Europe with no general speed limit. Eleven others have restrictions in varying degrees. Britain exercises the most rigid control of all, restricting the speeds of some vehicles on open roads and all in built-up areas.

The A.A. advises motorists driving in Denmark never to exceed fifty-five kilometres (thirty-four miles) per hour in towns and built-up areas—"but even this is considered too fast under some conditions."

Surgeon's Offer

Reading "Rodney was frozen to life" (JOHN BULL, May 12) I recalled the time when my brother-in-law—a major in a special unit serving in the Greek islands—was shot in the stomach in January, 1945. Although a Greek surgeon of international repute offered to save his life by packing him in ice and operating, an army medical officer advised against it. The patient died some days later.

The hospital matron told me that this surgeon had saved many Greek soldiers' lives by using ice before operating. I believe this surgeon was using induced hypothermia as early as 1940.—M. P. WHITE, Glasgow.

Rhyme And Reason

Patronage of the arts, once the prerogative of the wealthy few, depends these days on one or two public - spirited industrial concerns and the largesse of the state-aided Arts Council of Great Britain. The latter's latest balance sheet shows that grants to music amounted to £490,000, drama £63,000, art £27,000, and poetry £1,130. Has poetry become the Cinderella of the arts, or is it almost self-supporting? — M. G. B., Hertfordshire.

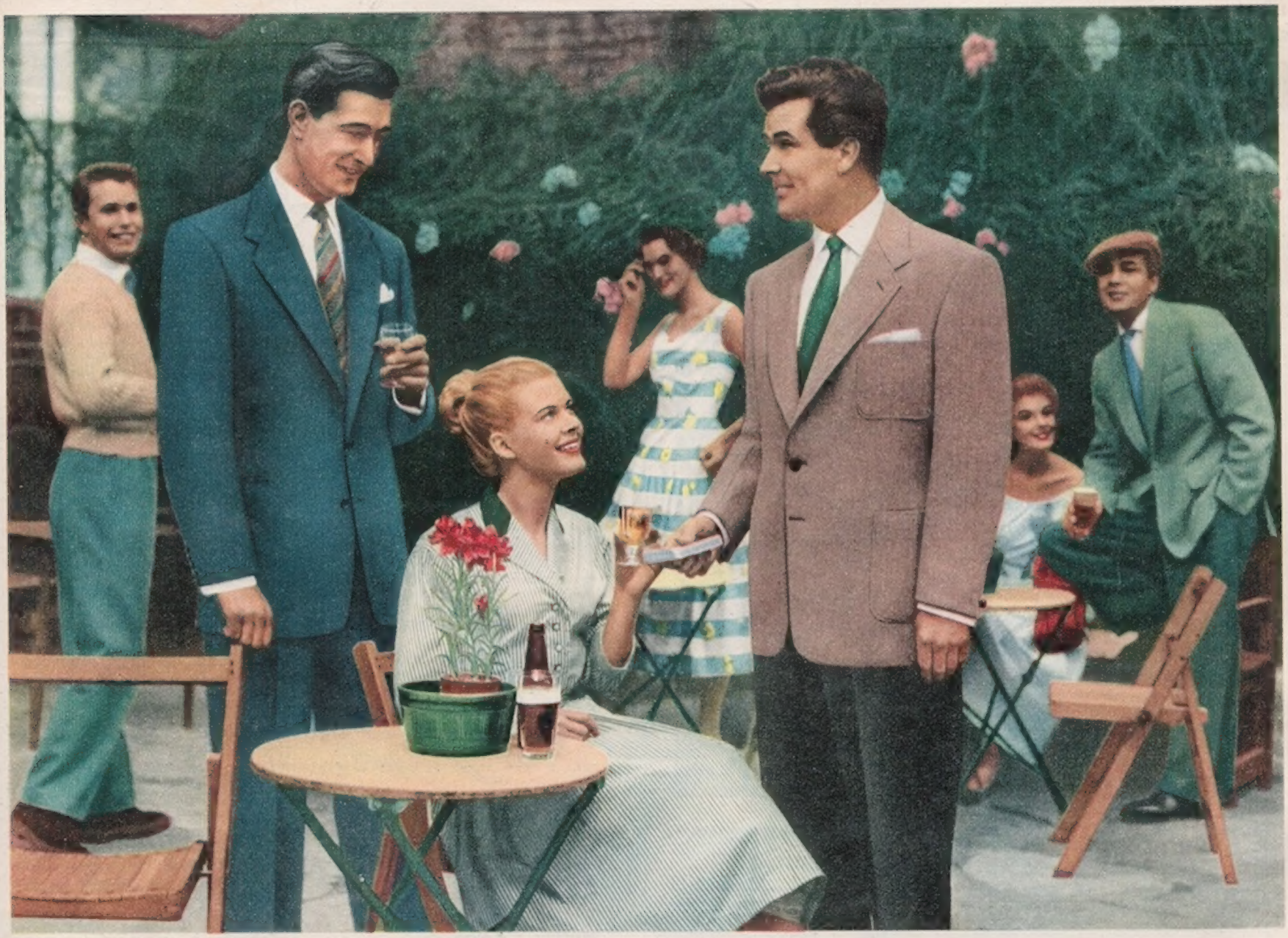
"The allocation to music includes £400,000 for opera and ballet — of which £250,000 goes to the Royal Opera House, Covent Garden, which is enabled to keep open all the year round, and £100,000 to Sadler's Wells," says the Arts Council of Great Britain. "Poetry is much cheaper to subsidise: we underwrite readings and festivals and, indirectly, assist the publication of books of verse."

Fair Means

I don't think women are basically any meaner than men ("Free Speech," May 12). It is just that their training and upbringing have taught them that it is the man's privilege to pay and the woman's privilege to be paid for. But my experience is that since the principle of equal pay has come to be accepted, so the tendency for women to help to pay their own way has become more pronounced.—J. E., Southampton.

. . . Many women offer to pay when they are taken out. I think the best way for a woman to do this is

CONTINUED ON PAGE 6



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Free Speech

CONTINUED FROM PAGE 4

for her to buy theatre tickets, for example, and offer them to her escort, because he may be a little embarrassed at taking the actual money. After all, it is only right to return hospitality.—Miss H. C., Newcastle upon Tyne, 2.

Pay Up

After settling an electricity account, I was interested to see that as the amount was for over £2, the receipt bore a 2d. stamp. I have paid well over that sum in shops, but they seldom put stamps on their receipts. —Miss B. J. Denny, Norwich.

"Receipts for payments of £2 or over are not valid without the 2d. stamp, and without it they would not be admitted as evidence in a court of law," says a lawyer.

Hey Presto!

As an inspector in the Kenya Police, I have come across several cases of witchcraft ("The Tokoloshi's Ball Pen," John Bull, March 31).

Recently, one of my African askaris had his overcoat stolen. Witch doctors have a high reputation for

seeking out thieves, and I threatened to call one in. The next morning, the overcoat had miraculously reappeared, such is the fear that many Africans have of all who dabble in witchcraft.—R. Tench, Marania Police Post, Kenya Colony.

Button Choice

Why, when three perfectly good buttons and buttonholes are provided on men's and boys' suits (John Bull cover, April 21) is only one used? As my five young sons have become old enough for a tailored suit or a single-breasted blazer, I have fastened all three buttons, only to be firmly told I am wrong. — Mrs. W. Handley, Birmingham, 31.

"Three buttons are the fashion," says an expert. "Some people like to use all three, or just the top or bottom two, but tailors cut a jacket for the centre one only to be done up, and in this way it hangs naturally."

Dangerous Waste

Motorists should try to curb their dangerous habit of throwing cigarette ends, ice-cream cartons, apple cores and other odds and ends from cars. The other day I saw a driver throw away a cigarette which hit a girl cyclist on the arm and made her swerve and nearly cause an accident. Actions like this merit censure, but I notice this point is not covered by the Highway Code. — M. H. Prior, Tilehurst, Reading, Berkshire.

"Every road user has a duty to use care and consideration towards everyone else on the road," says a lawyer. "Any breach of this could be held to constitute negligence, and the offender held liable for any resulting damage."

Open Secret

Transporting articles unwrapped certainly has advantages ("Free Speech." May 5). I make lampshades, which I often take by hand through crowded streets. When I wrapped them, I often had difficulty in avoiding bumps and dents, but now that I carry the shades uncovered everyone gives me plenty of room.—D. Hooper, Somerset.

Out Of Place

While I appreciate the excellent work of the National Playing Fields Association, it seems to me that someone ought to start a campaign to persuade children to use the playing fields provided. There are at least four of them within five minutes of my home, but summer evenings and school holidays produce a constant uproar of street games, and children retrieving their balls from gardens without permission are causing considerable damage.—Mrs. Edwards, Wyncham Avenue, Sidcup, Kent.

Floral Custom

Wyles's young man with the flowers (Cover, John Bull, May 12) reminded me of the time when a young Dutchman called to see my daughter. He handed me a lovely bouquet, and I thanked him and said my daughter would be pleased. "The flowers are for you, madame," he said. "In my country it is the custom to give flowers to the mamma." A pleasant gesture, and a shrewd way of breaking the ice. — Mrs. A. Caldow, Glasgow.

. . . A ten-year-old boy camping near my home called with a huge bunch of flowers behind his back, and asked to see my eight-year-old daughter. When she appeared, I moved tactfully away—but not before I had caught his opening remark. "Joan," he said, "can you lend me a two-pound jelly jar to put these flowers in?"—Mrs. B. Wood, Alexandria, Dunbartonshire.

Time Is Money

If shopkeepers forced us to pay a charge of 3d. for being told the price of an article, we would say they were scoundrels. Yet the Post Office does it—every time we ask the price and time of a long-distance telephone call. —E. J. Kymaston, Bath.

"This charge was introduced in January to cover the cost of the considerable work entailed," says the

CONTINUED ON PAGE 8

THE COVER

The slogger of the side is out for a duck—and the family's there to see it. Oh golly! It's a tragic situation for a sportsman. A lesser player would concoct excuses on that long tramp back from the wicket, but not Mays's cover batsman — a cricketer courageous if ever his young sister saw one. He knows when he's beaten. Still, even a duck has its dividends. After all his neglected advice about playing a straight bat, Father's reputation as a cricketing authority is redeemed. And that's very welcome; he did much the same thing in the Parents' match.

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Free Speech

CONTINUED FROM PAGE 6

Post Office. "The number of subscribers using it is comparatively small, but they are mostly large users of the trunk service. We felt that those who want the service, rather than subscribers generally, should pay for it."

Gardening Drive?

In addition to all his other qualifications, it seems that the cheerful, conscientious R.A.C. patrolman must also have green fingers.

Visiting the east coast recently, I noticed that each R.A.C. box I passed

was surrounded by a small garden. At one of them, cultivation was in progress, and the patrolman appeared to be really enjoying his work.—LEWIS P. MILES, Prestwich, near Manchester.

Both the R.A.C. and the A.A. encourage patrolmen to keep the plots surrounding boxes as attractive as possible. "But they don't have to be experts," adds the R.A.C.

Library Fines

Your barrister ("Spot The Lawbreaker," JOHN BULL, May 19) says that library authorities do not have specific power to claim fines from people returning overdue books.

How is this breaking the law? Libraries could only do so if legislation existed to prevent fines being demanded. But you say that no such legislation exists.

The rather frightening implication is that any action we commit is illegal until a law is introduced to permit it. —B. G. T., Tunbridge Wells, Kent.

"The fact that there is no law to forbid library fines is immaterial," says a lawyer. "There must be special authority to impose fines, because under common law only the Crown has power to inflict punishment."

Too Deferred?

As one who has dealt with hire purchase firms, I have always understood that inquiries were handled in strictest confidence and the customer's confidence respected.

A trader tells me that he had been visited by a hire purchase company's representative, who told him that they intended opening a branch in that district. The representative wanted to know if several people were customers of the shopkeeper and whether they were good or bad payers.—G. J., Stirlingshire.

"Unless a customer has given a trader's name as a reference," says a lawyer, "inquiries by a hire purchase company, although not illegal in themselves, might well lead to a breach of confidence. Anyone giving an unfavourable answer might run the risk of a libel action."

Cut And Trust

About forty years ago, at a small ironmonger's shop here, I bought a household chopper for about 2s. 6d. The steel head was shaped like a woodman's axe, and I was amazed to find a label attached, saying: "When you get home, chop an iron bar with this axe. If the edge is damaged in any way bring it back and we will give you another one." I took the manufacturer at his word, and with my whole strength I struck a wrought-iron bar. Result: a deep wedge-shaped notch in the bar, leaving the axe edge undamaged. Now after all those years of constant use, the edge is still unnotched anywhere, and I can still sharpen a pencil with it. — C. HOWARD, Alpha Terrace, Nottingham.

"This was quite a good-grade standard steel, but hand forged instead of machine made as it is today," say the Sheffield manufacturers. "In those days we tested the axes by actually hitting them on an iron bar ourselves before advising our customers to do so. We still make these axes, but we no longer resort to hand testing."

Work For All

I was impressed by the coincidence of the appearance of "Robots On The March" (JOHN BULL, May 5) and the strike of thousands of workers against redundancy caused by automation in the motor industry.

I believe the introduction of automation strengthens the case for aiding the world's under-developed areas, where there is a vast potential demand for goods, whose manufacture would keep our workers busy for years.

The alternative to trade expansion is slump. Could anything be more ironic on the threshold of prosperity? —G. A., Manchester.

Liquid Asset

There is no need to journey to Rome to throw coins in a fountain. There is one here in Hull, on one of the bombed-site development schemes. Coins are thrown into the small, ornamental fountain by passers-by.—MRS. B. RICHARDSON, Garden Village, Hull, Yorkshire.

"The fountain is the central feature of a triangular garden in a road junction, and is raising funds for comforts for aged people," says a Hull Corporation official. "People are throwing halfpennies and pennies into it at the rate of £1 a day."

Ready Made

On a recent trip through France, I came across this unusual restaurant in the village of Joigny, near the Franco-Swiss border. It is called "Le Capoé" and consists of four

giant wine vats which were thatched and then furnished inside with tables and chairs.

While lunching there, I drank Burgundy, the wine which once filled the vats to the brim. — MISS R. BECKER, Avd. Felipe Segundo, 11, 6 derecha, Madrid, Spain.

Within Reason

The "scholarship" examination may justify criticism, but not on the grounds that adults find difficulty in answering the questions ("Free Speech," May 5).

These are designed to test a child's ability to put two and two together; not to find out how much information he has stored in his mind. Adults have a much larger stock of facts, but their ability to see new relationships is not so active.—W. E. C., Belfast, Northern Ireland.

"It is true that intelligence tests are designed solely to assess a child's reasoning power," says an educationist. "This is quite distinct from knowledge, which is tested in the English and arithmetic examinations."

John Bull pays one guinea for each letter published in "Free Speech," and at the usual rates for photographs. Readers with problems (other than medical) should write to the John Bull Free Advice Service, whose experts answer questions by post

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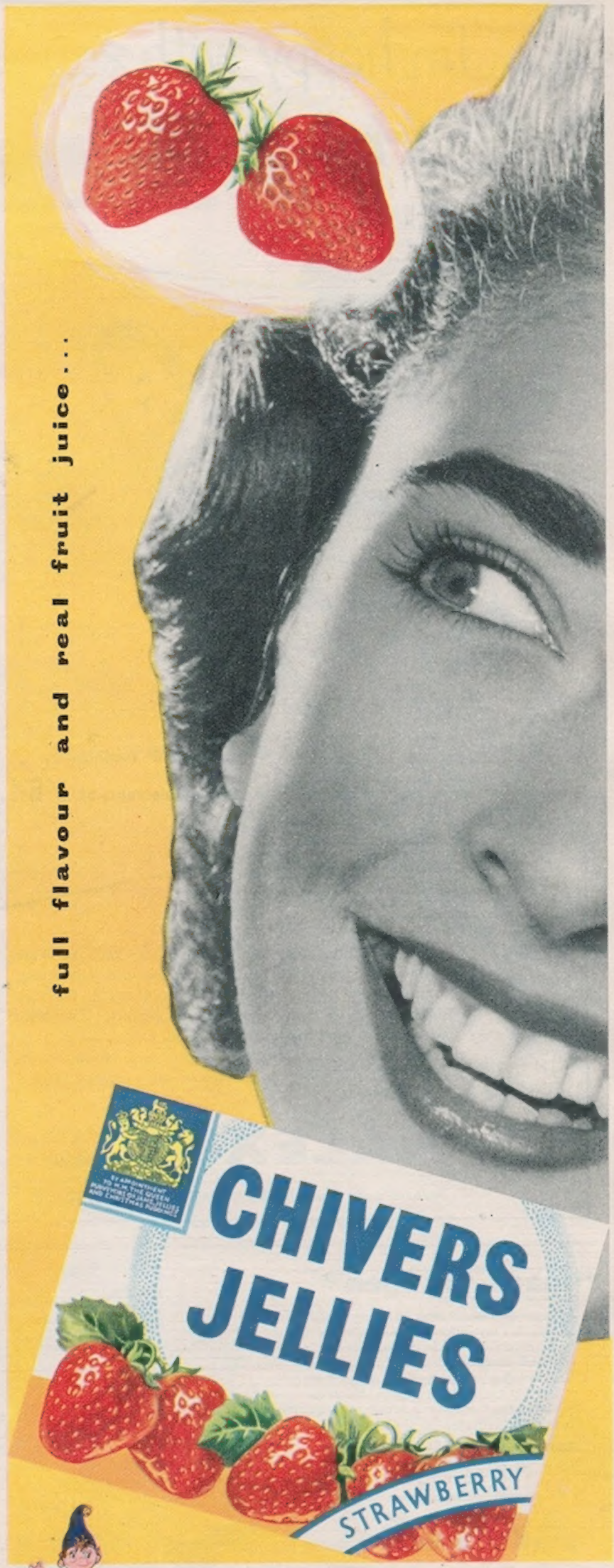

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The fantastic exploits of the secret weapon scientists

Wizards at War

GERALD PAWLE

COMMANDER RICHARDSON, a young, fair-haired naval scientist, had an uncontrollable habit of doodling on his blotter or fiddling with anything that came to his hand whenever he used the telephone. One morning in May, 1941, as he sat at his desk in an Admiralty office waiting for the switchboard to take his call, he picked up his ebony ruler. Absent-mindedly, he aimed several playful blows at a two-pounder starshell which he was using as a paperweight. The starshell exploded, ejecting a flare and a parachute, and the whole room was swiftly filled with choking clouds of bluey-green vapour.

Some of his fellow officers fought their way to the emergency fire escape. Enthralled crowds in Lower Regent Street watched others, silhouetted against a glare from the room, hang gasping for breath out of the windows while the green fog swirled around them. Noting the uniforms of the distressed victims, knowing bystanders concluded with satisfaction that the Royal Navy had invented a new secret weapon.

In fact, they were not far wrong. Had they been able to look inside the cloud-filled room, they would have seen that it was unlike any normal and dignified Admiralty office, but resembled some monstrous Wellsian workshop. Parts of aircraft wings rested nonchalantly against the walls; in odd corners were stacked

Rockets hissed up, and the attackers met a curtain of steel

ILLUSTRATION BY CLIVE UPTTON

When young Charles Goodeve formed the Wheezers and Dodgers, an admiral said: "I want results, and I want them soon"

Rocket ships developed by the Wheezers and Dodgers blasted the Normandy beaches in June, 1944

Denys Richardson, who succeeded Goodeve. He once created pandemonium by exploding an old starshell in his Admiralty office

piles of parachutes and balloons of various colours, empty projectile cases, bundles of ignitors, and coils of wire.

For this room, which lay above the Hungaria Restaurant, was the wartime home of one of the strangest teams of backroom boffins ever brought together — the Department of Wheezers and Dodgers, or, to give it its official title, the Royal Navy's Directorate of Miscellaneous Weapon Development.

Working in secret—and sometimes in considerable danger—the Wheezers and Dodgers were to produce some of the most extraordinary and devastating weapons of war ever invented: rocket-propelled spears for hunting U-boats; "guns" for dazzling night-fighter pilots; minefields that were "sown" in the air; roads that floated on water; invisible boats for raiding parties; monster steel amphibians for breaching enemy coastal defences; and a score of other inventions with strange names like Hedgerow, Bookrest, Strength Through Joy and The Great Panjandrum. Today, most of their achievements are no longer on the secret list, and their adventures in what Winston Churchill has termed "The Wizard War"—the ceaseless struggle for mastery between allied and enemy scientists—can at last be told.

Perhaps the most important of all the projects on which the Wheezers and Dodgers worked was the Grasshopper, a fearsome weapon which was vital to our invading armies.

One of the major difficulties facing the men planning the invasion of Europe was to find a way of swamping the enemy defences during the time-gap between the end of the naval bombardment and the touch-down of the first men to reach the beaches.

It seemed to the planners that the assaulting infantry must be accompanied by their own floating artillery—guns, mortars and batteries of rockets mounted in small craft. From this vital need sprang the Rocket Landing Craft, the most formidable weapon in all the long history of shore bombardment.

The original idea for a landing craft crammed with rockets, which could loose a cloudburst of high explosive over a limited area, came from a Colonel Langley, who was attached to Combined Operations headquarters, and the Wheezers and Dodgers were asked to draw up plans for a bombardment weapon of this kind which could be both elevated and trained.

A FEW days later, Charles Goodeve walked into the office. Goodeve was the man who had formed the Wheezers and Dodgers. He had come to talk over the possibilities of a new gunnery recoil system with Denys Richardson, who was now in charge. Goodeve noticed someone working at a drawing board on the plans of Grasshopper—as the rocket craft was known in its embryo stage. After studying the drawings he said to Richardson: "Surely that must be the wrong approach. If you have to train and elevate the banks of rockets you'll run into all sorts of unnecessary complications. Why don't you point the ship at the target and discharge the rockets straight from their stowage lockers by the ripple-firing system?"

The department had already used ripple firing with great success. It was simple and almost foolproof. In front of the operator was a circle of studs, each one connected to a group of rockets, and when an arm—geared, to guard against over-rapid movement—passed across these an electrical contact was made and each batch of rockets fired in quick succession.

Goodeve knew that this method was ideal for the job in hand. The department prepared plans for a fixed projector, and he persuaded the naval authorities to accept it.

The Grasshopper raised a number of novel problems. The intention was to fire between eight hundred and one thousand rockets from one ship, but the vital question was: "How many can be discharged at the same time?"

In the first trial, which took place off Spithead in bad weather on April 11, 1943, the size of the salvoes was gradually increased to 198 rockets, fired in groups of thirty-three at intervals of half a second. At each discharge blasts of hot air eddied back over the screen on the bridge, and by the fourth salvo the searing heat was building up so fast that two department scientists, peering over the side, had their hair, eyebrows and clothing severely singed.

It was obvious that members of the crew in exposed positions would be seriously burned if the complete mass of rockets was fired at once. And hundreds of the rockets would be subjected to flame and very hot gases; this might well cause an explosion.

The heat problem plainly required further

Leo Lane stumbled on the first slender clue that led to the invention of plastic armour, protecting an escort carrier's bridge (right)

examination and on April 21 tests were carried out by remote control. The Wheezers and Dodgers planted a number of devices on board for gauging the temperature in the rocket tails —sensitive paints, alcohol thermometers and certain crystals with a known melting point which were sealed in small tubes.

This time 759 rockets were fired in the usual batches of thirty-three. Great waves of flame swept over the bridge of the landing craft, and the fierce build-up in temperature sent a flood of red paint pouring through cracks in the deck to smother the array of scientific detecting instruments which were thought to have been safely positioned below.

Temperatures of more than 800 degrees Fahrenheit were recorded near the rockets, and when an electrical fault led to two salvoes firing very close together the heat went up to one thousand degrees.

To close observers, the Rocket Landing Craft in action was an unforgettable sight. Stretching away along the lower deck from the base of the bridge were serried ranks of huge rockets, all inclined at an angle and looking like some strange, stunted forest. In a few seconds the entire mass—hundred upon hundred of them—could be discharged into an area only 750 yards long by 240 yards deep, and when the salvoes were fired the ship became shrouded in a swirling blanket of smoke and flame, out of which the rockets rose like flights of birds with fiery tails.

PROTECTIVE measures were put in hand by the department, and trial number three was staged off Portsmouth on April 28. This time a slight stern wind was blowing and it was cooler on the bridge, but the deck and the projectors became hotter than ever before. It was apparent that on a warm day the risk of a general explosion in the landing craft would be high.

A few days later the team experimented in a new direction, flooding the deck with sea water during the firing period. This proved a great success and it was decided to go straight ahead with this formidable new assault weapon. Plans called for the conversion of thirty landing craft by April, 1944, and each would be capable of delivering a full salvo of 1,080 rocket shells.

The Rocket Landing Craft, which carried more explosive for its size than any vessel ever used for bombardment, provided a terrifying and completely successful answer to the problem of destroying enemy morale at the most vital moment of a landing operation. Both in the Mediterranean and the Normandy assaults to come it was to prove a devastatingly effective reinforcement to Allied gunfire.

The Wheezers and Dodgers' adventure began at the time of Dunkirk, when Charles Frederick Goodeve, a young R.N.V.R. officer, asked for an interview with a bluff, shrewd sailor named James Somerville, who was later an Admiral of the Fleet.

Goodeve was a Canadian in his middle thirties. He had come to England twelve years earlier on an Empire scholarship, and when war broke out he was Reader in Physical Chemistry at University College, London, and had also made rapid progress as a private consultant in chemical and electrical engineering.

As a youngster he had joined the Canadian navy's volunteer reserve and when he came to England he transferred to the R.N.V.R. In the years before the war he went to sea in submarines, minesweepers, battleships and destroyers, and began to specialize in the electrical side. By the time war broke out he had been right round the navy, studying tactics, investigating technical problems and arguing long into the night on the part which science would play in the war at sea.

Lieutenant-Commander Goodeve's training as a scientist and sailor were quickly put to a test at H.M.S. Vernon, the torpedo and mining establishment at Portsmouth, where he developed two highly successful counter magnetic-mine devices, and it was through this work that he came to hear of a new scientific research department that was being set up under Vice-Admiral Sir James Somerville.

The two men met in a house above the fortress at Dover, and Goodeve took to Somerville immediately. The admiral had a shrewd, wide-ranging mind, and as they snatched a hasty meal they mulled over ideas for anti-aircraft measures, passive defence and rocket warfare. It was after daybreak when Goodeve left to catch the first train to London. In his pocket was a request to the Admiralty scribbled in Somerville's strangely boyish handwriting on a sheet torn from a signal pad. It asked for Goodeve's immediate attachment to the department that later grew into the Directorate of Miscellaneous Weapon Development.

"Collect a small team and get to work on some of those ideas of yours," were Somerville's parting words. "You'll have a free hand, but I want results and I want them soon."

Somerville's department proved on inspection to house a surprising number of people, all crammed into one large room over the Admiralty Arch. It included, for instance, the entire Kite Balloon Section of the navy, already hard at work organizing the supply of balloons and winch gear to merchant ships.

But lack of space was least of Goodeve's immediate worries. He sat down at the one vacant desk and began to gather together a staff.

Among the first recruits was Denys Richardson, a naval scientist who had worked with Goodeve on the magnetic-mine projects. Not all the team were scientists, though. Their numbers were to include a former skipper of a South Seas schooner, a cowpuncher and welterweight boxer, a tree culture expert named Leo Lane, a water-colour artist, Donald Currie, who was to become the department's camouflage expert, and an engineer who has since become a world-famous novelist—Nevil Shute Norway.

Goodeve was in no doubt about his own immediate task. The navy was desperately short of close-range weapons, and in this high summer of 1940 many merchant ships faced the long hours of daylight with a single machine-gun as their sole armament. One report to reach the Admiralty told how the crew of a coaster, the ammunition of their only Lewis gun exhausted, defiantly hurled lumps of coal at an attacking aircraft. If the life-line was to be held, and the morale of the merchant seamen kept high, the ships must be quickly fitted with devices for striking at their attackers.

Another great need was for some physical protection for the seamen who had to face a

Continued on page 51

A young wife's story of a desperate bid for freedom

OUT OF THE CITY OF FEAR

by Scarlett Panufnik

SCARLETT was the first to escape. She reached Britain in March, 1954. Then her ordeal began. For months she was to fight a battle of wits against the security men of Communist Poland's London embassy. The price of failure would be the ruin of her happiness.

For her husband was trapped in Warsaw, in the city of fear where she had lived for eight years. . . .

Scarlett's life should have been gay and splendid. She was Irish, beautiful, with flecks of red in her dark hair. She was married to Andrzej Panufnik, a young composer who was fêted as one of Poland's leading musicians. She had moved in the world of Poland's élite. . . . But she had had to watch as, month after month, the Communist régime sapped the genius of the man she loved. And she had faced the squalid power of the men of the secret police.

Andrzej Panufnik and his wife in London

Now Andrzej was being held as a hostage to ensure her return from the free West. Only a miracle of bluff would win freedom for him. . . .

Two years afterwards, Scarlett Panufnik now tells her own story of a desperate gamble, played out in three great cities: in London, in Warsaw, and in Zürich. It is a story of amazing courage and devotion. Superbly illustrated, it begins . . .

NEXT WEEK IN JOHN BULL

THE PROVING FLIGHT

by **DAVID BEATY**

ILLUSTRATED BY ZELINSKI

Their plane lurched crazily through the air. It was flying into disaster—and no one knew why

It was the worst storm for years. Far out over the dark Atlantic the Emperor—Britain's latest airliner—battled bravely westwards. But her pilot, Captain Andrew Bellamy, knew she was losing the battle.

She had set out to fly from London to New York non-stop, but she couldn't make it now. . . .

Bellamy weighed up the chances. Then, reluctantly, he turned the nose of the big plane north and headed for Iceland and the haven of Keflavik airport.

He had command of the plane for the first leg. His co-pilot, Captain Cavendish, was a veteran of enormous dignity but little recent experience. Already they had crossed swords on the flight deck.

There was rivalry, too, in the galley where the stewardesses, Lalette Greenacres and Angela Knight, eyed each other covertly—and thought of Andrew Bellamy. . . .

Behind the flight-deck, in the passenger cabin, sat the V.I.P.s. Mr. Brocklehurst, the under-secretary, sat next to Sir James Joliffe, chairman of Air Endeavours, the firm which owned the Emperor.

Eastlake and Cruttwell, the two designers, were in opposite seats—each ready to blame the other for anything that went wrong with their seventy-ton brainchild.

Captain Bellamy went back to report the change of course to Sir James, well aware what a bitter blow it was to the chairman's hopes. Then he returned to the cockpit—and a tense silence.

As he slipped into his seat he saw that another entry had been made on the weather card. Visibility at Keflavik was lessening—RAPID DETERIORATION EXPECTED. . . .

The chairman was full of respect. "Leadership! The pioneering spirit! You, Captain Cavendish!"

PART TWO

"... *Airborne Within The Hour*"

The North star crawled higher in the sky. Perfectly at ease, Emperor Alfa Delta droned on the way Bellamy had pointed her, nearer and nearer towards Iceland. Every half-hour Hooper made another addition to the weather card concerning the surface conditions at Keflavik. Heavy snow was now being reported with a visibility of less than half a mile.

Bellamy sat quietly in the left-hand seat, studying the Notams—notices to airmen concerning aerodrome states and the serviceability of blind landing aids. A near-blind landing would be needed tonight.

Cavendish had changed places with Seawood, the Emperor's first officer, and was now pacing the tiny floor of the cockpit as though it was a quarterdeck. Every half-hour, as though he could influence the instrument, he bent over the radio while Hooper took down Keflavik's latest weather. But his presence made no difference. The Emperor was racing north at a groundspeed of over three hundred miles an hour, but the storm had had a long start.

"You'll want me to stand between you," he said to Bellamy. "To keep a look-out for the runway."

"Please."

There was another three-quarters of an hour to go. Time to descend. Hooper obtained clearance, and Bellamy nosed the aircraft gently downwards.

The dark tops of the cloud came slowly up to meet her. And then, in a great wet welcome, they hugged her all over. The Emperor's wings shivered from the shock. Snow softly flew towards them in a long unending pattern of dots. The altimeter, like a clock going backwards, read 16,000 . . . 15,000 . . . 14,000.

On the V.H.F. voice radio, they could hear Keflavik Tower giving instructions to another aircraft. Bellamy said to Cavendish: "There's a DC 6 gone back to London."

"Why . . . ? Couldn't he get in?"

"No."

The altimeter unwound past 5,000 feet.

KEFLAVIK APPROACH cleared them to the Tower, and the Tower, having obtained two-way communication, informed them that they were "now Number One."

Impatient as he was to get down, mindful of the probable increasing violence of the weather, Bellamy nevertheless knew there were no short cuts to safety. The weather and the visibility were almost impossible. Therefore his flying must be dead accurate, unhurried.

"Visibility," the Tower said, "is now two hundred yards."

Bellamy throttled back further, and descended to 1,500 feet with half-flap and undercarriage down, and all landing checks complete.

"On finals," Seawood told the Tower.

Cavendish stood quite still between the two pilots, alternately staring ahead into the snow-filled darkness and looking at the stop-watch, timing them from the outer marker. The Emperor was rocking around like a wild thing. Everyone in the cockpit was held by the tenseness of Bellamy's concentration.

Lower and lower the aircraft descended into the blackness of the night. The altimeter lazily unwound, 600 feet . . . 500 feet . . . 400 feet . . . 300 feet. Seawood was calling out their height above the airfield. At two hundred feet, they seemed to break cloud, but the only difference

"Leave me alone," said Angela sharply. Lalette pretended to be absorbed in unzipping her skirt. Then she heard a snuffle . . .

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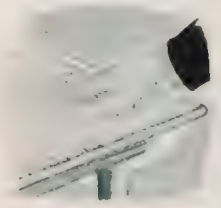

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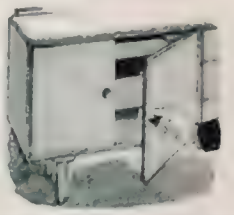

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was that it became slightly less dark and now the red light on the nose did not reflect back at them.

"Time!" Cavendish called.

"See anything?" Bellamy asked.

"Nothing!"

"Gear up! Rated power!"

At maximum continuous power, the Emperor raced back into the night again. Bellamy took her up to 1,500 feet, and once again began the complicated manoeuvre of positioning the heavy aircraft in line with the invisible runway.

The Tower reported that the wind had dropped a little. There didn't seem to be so much blowing snow. But on the next approach, though Bellamy brought her down lower, nobody saw anything. On the fourth attempt, Seawood caught a glimpse of two runway lights, flashing by in a sodden, muzzy glow—so separate that they seemed to belong to another world, an uninterested placid world which had no business to do with Emperors.

But someone had at last seen something. The runway was *there*. And on the fifth approach, there was more hope in the cockpit.

Sweating a little with the effort of manhandling the aircraft, Bellamy brought the Emperor down past 200 feet . . . 100 feet. . . .

"Fifty feet indicated," Seawood warned.

Cavendish called out: "Five seconds to go."

Bellamy counted them to himself—one, two, three, four, five. "Any sign?" he shouted.

"Nothing," Cavendish said. Then: "Wait! Yes . . . there are the threshold lights."

BELLAMY allowed his eyes to come away from the instruments and look out. He saw one white light. He called abruptly: "My throttles!" and, slamming the four levers hard back, pushed the nose down.

Another white light reluctantly revealed itself, slightly below them and to port, before snuffing out. The speed dropped past 110 knots. Bellamy edged the Emperor's nose higher until she started to sink into the black bottomless pit below her. He opened the throttles so she hung on her propellers.

Then he saw two more lights, one on either side of the runway. More slowly this time, he closed the throttles again and hauled back on the nose. Slowly, the Emperor mushed on to new-laid snow. Her wheels made a soft crunch, and began to slow up rapidly. Then she stopped.

For a few moments, nobody in the cockpit said anything. Bellamy got a handkerchief and wiped the sweat off his face. Seawood said: "Nice landing, sir!"

"Well, at least we're down. Problem now is . . . how do we find the ramp?"

The Emperor crawled forward from one dim glow to another. Eventually, over two thousand miles away from where a swarm of high-up aviation officials were making their way to New York International Airport to welcome her, the Emperor—her four propellers threshing the wet air, her brakes gently squeaking—loomed up out of the snowstorm, bedraggled-looking and half-frozen, to make her first appearance on foreign soil before an audience of three.

One of those three was Murdoch, the company's one representative in Iceland, only too unhappily aware of the great honour that had unexpectedly been thrust on his shoulders.

The other two were American air force marshallers, each with a torch. They took in the unfamiliar outlines of the Emperor's unorthodox design, and one of them said to the other, in a voice shrill with indignation: "Aw, Eddie, what we got here—a flying saucer . . . ?"

In the packed reception hall, the inhabitants of the Emperor surrounded Mr. Brocklehurst, the under-secretary and Sir James Joliffe, chairman of Air Endeavours, with a protective palisade against the onrush of humanity. Irritable voices muttered and shouted. Men parked round the bar. Women sat patiently shushing the children. The harsh metallic voice of the Tannoy regretted to announce cancellation after cancellation.

Sir James was drinking coffee, firmly impressing Brocklehurst with the fact that "it was the worst Atlantic weather within living memory"; and adding on the bright side: "We'll be airborne within the hour. Six hours or so late . . . that'll be all."

He saw Bellamy struggling through the mob. "Want us out at the aircraft right away, Captain?" he said eagerly. Then he saw the bad news in Bellamy's eyes. "Well . . ." he added grimly. "What is it this time?"

Eastlake, the airframe expert, and Cruttwell, the engine designer, individually held their breath. Then each of them saw the pilot produce the folder he had been given at the meteorological office and they could breathe again. Nothing to do with either of their departments after all. Bellamy said: "The weather . . ." and began to explain.

Sir James waited until he heard the word "nightstop," before saying quickly: "Was Captain Cavendish with you at the meteorological office?"

"He was, sir."

"Then where is he now?"

"He's arranging accommodation with Murdoch." Bellamy paused. "It isn't going to be easy, with all this crush."

Sir James said: "I feel we should discuss this situation together, Captain Bellamy."

"Can't see there's anything to discuss, sir."

He was so glaringly wrong that the chairman did not trouble to disagree with him. All Sir James did was to call out, louder and more insistent than before: "Where's Captain Cavendish? I want Captain Cavendish. Ah, there he is!"

One head taller than the sea of faces around him, the older pilot, with Murdoch slightly ahead of him, slowly struggled towards them. The company representative reached the circle first. He said: "I've got two rooms, sir. Mr. Brocklehurst in 21. And you in 24, Sir James." He turned to the others and ruefully shook his head. "Nothing else left, I'm afraid." But the chairman brushed the man aside "Captain Cavendish," he said, "you've seen the weather?"

"I have, sir. A most complex situation!"

"But surely there must be somewhere——?"

Cavendish methodically stroked his chin. "The temperature at Montreal——" he began.

It was enough. Through the grey overcast the chairman had seen the glimmerings of light. His hand came up under Cavendish's arm. "This calls for a get-together. Between the two of us, I mean. Room 24, Murdoch said. This noise! Up there, at least we'll be able to hear ourselves speak."

It was perfectly obvious to the Emperor's crew and passengers, as Cavendish and Sir James left the circle, that Bellamy was in disfavour. Cavendish was the chairman's man now.

SIDE by side, they mounted the stairs to Room 24. It was very sparsely furnished. There was one chair and a small bed, with a rectangular slab of grey wool, placed like a prayer rug on the plain wood floor beside it.

"You take the chair. I'll sit on the bed." Sir James's body dented the clean counterpane. He leaned towards the pilot, and immediately came to the point. "Now I shall be quite frank with you. A lightning sketch of all the things *behind* the building of the Emperor . . . that's what I'm going to give you."

He had a wonderful control over words. He picked the powerful ones out as easily as an artist chooses and blends the colours from his palette. The spaces, the change of tone, the lines of the long sentences followed by the emphatic dots of the short ones, all vividly contributed to the design of all his difficulties, the invisible blots on the Emperor's silver sides. And right in the foreground, painted a rich overdraft red, was "the money involved."

He finished by saying: "And these enterprises are always so uncertain that something quite minor," he shrugged his shoulders, "like

Continued on page 44

Lalette saw the fear in Angela's wide eyes. "It's all right now," she whispered. "Look, everything's working"

If you can brush after meals, that's best—if not, here's

NEWS! A toothpaste for people who can't brush after every meal-

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Spinning hair into gold

by KEITH ELLIS

More money than ever is being spent on the care of the head . . . while the human race gets balder every day

Professor John Speakman of Leeds pioneered research into hair waves. His discoveries led to the first home perms

Hairdressing is a thriving business: in one year 5,440,000 women took their perms in salons

RECENTLY a young National Service man reported for his annual Territorial Army training with a Tony Curtis hair-style. Outraged at such a blatant breach of regulations, his company commander ordered him to have it cut. The man refused. At the subsequent court-martial, which sentenced him to twenty-eight days detention, he explained: "In the last two years I have spent £70 on my hair. If I have it cut now, it will take me six months to get it back to normal."

Today Britain is spending more than ever on its hair. Young men like the National Service man, who in civilian life earned £14 a week and spent eleven shillings of it at the barber's, have brought jubilation to the hairdressing trade.

"The year 1955," trumpets the annual report of the National Hairdressers' Federation, "is certain to rank as the greatest boom year for hairdressing in Great Britain. Rising pay plus hair consciousness never before known in our history have contributed to a bumper year."

A survey taken in 1955 showed that in the previous twelve months, 5,440,000 women took one or more perms in a hairdresser's. Meanwhile, the substantial minority of men's barbers who offer hairstyling—quarterly perms at £2 5s. to £4 4s. with weekly shampoos and sets at 7s. 6d.—are making small fortunes.

The raw material on which hairdressers exercise their craft hardly seems a promising medium. Like the horn of a rhinoceros, the hooves of a cow, the quills of a porcupine, whalebone, wool and human finger-nails, hair is a form of skin. It varies in diameter from 1/5,000 in. to 1/250 in., and left to itself will grow to lengths varying between a fraction of an inch and more than a yard. Blondes have about 140,000 hairs on their heads, brunettes 109,000 and redheads a mere 90,000.

Each hair grows from a root at the bottom of a tiny pocket in the skin called a follicle. It is coloured by pigment, produced where it joins the root, and is so strong that, double, it will support a weight of seven ounces. It has a tough, transparent outer skin whose cells overlap like the slates on a roof with the free ends pointing away from the scalp. That is why a hair rubbed between thumb and finger curls towards the root end.

Nobody knows why some people have curly hair and others have not. Curly hair is always flattened or oval in section, while straight hair is circular, triangular or kidney-shaped. Some experts have said the flattened shape actually causes the curl. Others suggest that the cause is a twist in the follicle or some modification of the root.

The widespread preference for curly hair has led hairdressers to improve on nature with water-waves, heat-waves and so-called permanent waves. Like many craftsmen, they have worked mainly by trial and error, and it is only in the last twenty years that the scientific basis has been understood. That knowledge led straight to the home perm.

In 1933, William Macdonald read an article in a technical journal by Dr. J. B. Speakman of Leeds University on the steam treatment of wool during the manufacture of worsteds. With his brother Hugh, Macdonald went to see Speakman in Leeds. When they returned to London that same evening, they had retained Speakman as a consultant and hired his assistant, Dr. Norman Chamberlain.

One day in 1934, after months of research, Chamberlain gave his wife, Olive, the world's first low-temperature perm. "It was a bit weak, but it lasted six months."

The Macdonalds were wrong in their fears that home perms would ruin the hairdressers. Of the 4,008,000 women who gave themselves home perms in 1954, 850,000 also took a perm at the hairdresser's.

Taylor Briggs, the shrewd general secretary of the National Hairdressers' Federation, says: "At first, we thought home perms would damage our trade. Now, we believe they have done the hairdresser more good than any other single thing. They've stimulated a greater interest in hairdressing generally and many of the women who fail at home—as they often do—come to the saloon to have their hair put right."

Many ancient and modern beliefs about hair are untrue. Cutting, shaving or plucking hair does not make it grow thicker or faster. Singeing, far from keeping hair healthy by sealing the ends, causes serious damage. Nor are men with good heads of hair more virile than those less well endowed.

But hair can stand on end. Each root is supplied with blood vessels, nerves and muscles, and these, stimulated by cold, fear or electricity, may draw the follicle from its usual oblique angle to a position at right angles to the skin surface. A number of soldiers returning from Dunkirk in 1940 had been so badly shocked that for months afterwards their hair stood up like the bristles of a hog.

Doctors disagree as to whether hair can turn white overnight. Some say that white hair is

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Light green is the basic colour of the British-bred budgerigar, but the Budgerigar Society accepts sixty-four standard colours. The three birds shown above are (left to right) an opaline cobalt, a yellow-faced opaline cinnamon-wing blue and an Australian grey

At their Derbyshire home, Will Addey, secretary of the 26,000-strong Budgerigar Society, shows his wife a flighted pied budgerigar

A Japanese prince bought two budgerigars, and started a boom that swept Britain. Today, our birds are the world's finest

Colour on the wing

by RENÉ LECLER

Five American breeders question Will Addey (facing camera) at Chesterfield, Indiana, where he judged 1,400 budgerigars

WITH a sheaf of red prize cards in his hand, Will Addey was judging budgerigars in a London show last summer when a voice behind him said: "I want a red card." Addey turned round to reprimand the exhibitor who had broken a strict rule by speaking to the judge —but nobody was near. He walked on, and the voice added: "What about a red card for me?" It was budgerigar No. 3077 which, carefully trained for this occasion, had dutifully spoken its piece.

"That budgerigar talked out of turn," says Addey, who is secretary of the Budgerigar Society. "It did not even get a mention. But it amused me because they always talk when you don't want them to."

One autumn, Addey's wife spent three months teaching her pet bird Joey to say "Merry Christmas." Not a sound emerged and eventually she gave up. On Easter Sunday morning, Joey greeted her with a clear and unmistakable "Merry Christmas." Another bird Addey once judged at a show let out a shrill "puss, puss, puss, puss," sending hundreds of fanciers on a headlong search for the unwelcome cat.

Ninety-nine per cent of male birds can repeat up to a hundred words if taught patiently and kept away from their own kind, says Addey. But the female budgerigar is not a good talker.

Addey's society now has 26,000 fee-paying members and altogether about 60,000 people bred one and a half million budgerigars in Britain last year.

Since 1887, when a visiting Japanese prince paid £100 for a pair of turquoise birds, which he wanted to give as a present to his bride, and started what became known as "the Japanese boom," budgerigars have steadily gained favour at the expense of other caged birds. Britain is now known as the best budgerigar country and, in 1954, Will Addey was the first Briton ever to be invited to judge at shows in the United States and Canada.

A tall, slow-spoken Midlander who has been a breeder for thirty years, he has won about a thousand prizes, including more than two hundred trophies, in British shows alone; in one pre-war season he took home seventeen sets of fruit spoons and servers. His wife says: "That made up a bit for the fact that, like all budgie-crazy husbands, Will ruins his clothes by carrying seed in his pockets and the turn-ups of his trousers."

Addey and his fellow breeders can discuss most knowledgeably the sixty-four different colours accepted by the society as standard; these range from the light green—the basic colour of the British-bred bird—through complicated shadings such as opaline-cinnamon wings, yellow faces, cobalts, pure yellow red-eyes, slates, mauves and violets to the stranger lutinos which are pure yellow and to the pure-white albinos. One budgerigar, the half-sider, is green down one side and blue down the other. There are also pied budgerigars and others that are rainbow-hued. The Budgerigar Mating Book lists 1,837 possible colour permutations and crossings between birds of different plumage.

William Watmough, a Bradford business man who is chairman of the society, says: "When we get a new colour we know how to repeat it but most new colours are arrived at accidentally." He confidently expects the early arrival of pink and black budgerigars.

Most experts agree that the fascination of the fancy lies in the unknown element. "You mate your birds according to the book," says Addey, "but anything may happen. The better the bird the more difficult it is to breed." Once, he found himself with a remarkable pair of light greens and hoped to beat a champion breeder named Harry Bryan who has long specialized in that strain.

The hen laid four eggs and for several nights right into the small hours of the morning Addey stood in his aviary inspecting the eggs, holding them to his ear to hear the chicks chirping inside. After the normal incubation period of nineteen days, the first chick hatched. It was unusually large and with big feet—always a sign of a good budgerigar.

Addey telephoned Bryan and said: "By gum, I'll tan you with this." Bryan wished him luck. That night Addey found that the cock bird had killed the chick out of jealousy. Next day the remaining three eggs had been dumped into the drinking trough, again for the same reason. "That hen," he says, "never laid another egg."

The location of the aviary can alter breeding records. In one breeding season during the war, with his aviary in the loft of his family's sweet factory in Blackpool, Addey had ten pairs of birds that failed to produce a dozen youngsters, though the average is five chicks per hen. After months of trouble, he discovered the reason: an extractor fan on the ground floor of the building rarefied the air on the top storey. Iron and lime deficiency in water can also reduce fertility.

Apart from the vagaries of mating, breeders like Addey suffer many losses through accidents. Once his wife forgot to fasten the safety door of his outdoor aviary. A high wind blew it open and Addey reached home to see his entire stud flying off in a golden, green and blue cloud.

"I could have sat down and wept. I spent five hours working in the garden spreading half a hundredweight of seed in every possible corner to try to get the birds back. But they are good on the wing and eighty miles is nothing to them. Out of 150 I got sixteen back."

Another time, going into his aviary at dusk, he felt something whizz past his ear: it was a prize bird that had just won him a silver medal and several cups. Sometimes, the budgerigars unaccountably return; he once caught one by hand on the roof of his house after three hours' search. In recent years, several pet birds have been returned to their owners because they had been taught to repeat their telephone numbers.

Most budgerigar losses occur in the spring when pet owners grow careless and leave doors open and fires without guards. Once, a man brought Addey a budgerigar which used to go up and down the rope of a pulley clothes drier. The pulley had broken its leg but Addey made a splint and the bird survived. But he warns people that there is one accident he cannot make good: on several occasions people have brought him budgerigars that have been caught up in fly-paper.

A few weeks ago, Addey learned that a new member, a war veteran with artificial hands, had difficulty in ringing newly born chicks, he jumped into his car and drove 150 miles across country to do the job himself.

A post-mortem service, which he inaugurated so that members whose budgerigars died in mysterious circumstances could find the cause of death, gave him trouble from the start. One morning he heard a cry and rushed into the outer office to find that a new staff girl had fainted: opening the morning mail, she had found a dead bird inside an unmarked cardboard box. Now Addey insists on a tin box and the words "post mortem" on the wrapping.

BUDGERIGARS are usually mated in February and the hen lays one thumbnail-sized egg every other day for eight to ten days. The chick is hatched after eighteen or nineteen days incubation. The chick's head is larger than its body; it is blind until the seventh day and down starts growing only on the tenth day. By then the basic colour begins to show, but until the bird moults at three or four months, no one can foretell the intensity of the colours.

The breeder selects his show specimens, laying aside what is called the "cold stock," healthy budgerigars which do not come up to show standards. He can sell a surplus bird to another breeder or to a pet shop for anything between 25s. and £4. A champion bird whose pedigree is often as long as that of a race horse can fetch £50 to £100. "Only through this constant exchange," Addey says, "can the successful

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Critics once described the Festival Hall as a white elephant. Now it is booked six nights a week and on Sundays throughout the year

Bean entertains foreign visitors. He can make the most junior members of the chorus and orchestra feel at home

Ernest Bean brings music to a million

by JOHN ENNIS

The Festival Hall may not make money—but he counts the pleasure it gives as a profit

As Ernest Bean, general manager of the Royal Festival Hall, London, completed arrangements for two concerts to be conducted by Toscanini at the hall in September, 1952, he realized that he had yet to face his biggest difficulty. At eighty-five, the world's leading conductor would almost certainly be appearing in Britain for the last time. Bean rightly guessed that almost every British music lover was determined to attend one of the concerts.

The box office received more than 100,000 applications for the six thousand seats which were available for the two concerts. Bean's problem was how to dissatisfy thousands of music lovers in the fairest possible way. He decided to draw lots for the seats.

Bean, a neat, bald man with glasses, has a conscience which forces him to take endless trouble to ensure that tickets are sold with no hint of favouritism. "He calls in his departmental chiefs," says Lionel Fishman, the box office manager, "and he says, 'the fairest method is this. . . .' Faces blanch when we realize what 'this' means in the way of hard work."

People queued two days and nights for the 240 standing places at the Toscanini concerts. Bean provided empty offices for them to sleep in, and a free breakfast of hot dogs and coffee. It is now no longer necessary to queue for long periods. But those who do have to wait can listen to gramophone records of the star or orchestra they want to hear that evening.

It was popularly supposed that Bean was taking on a white elephant when he became general manager of the world's most up-to-date concert hall in September 1951. The hall had opened four months before to coincide with the opening of the Festival of Britain. Three concerts were cancelled in his first week. "That made headlines," he says, "but I had no real fears because I knew of all the concerts that had not been cancelled."

In the last recorded year, from March 1955 to March 1956, 507 functions were held in the auditorium. In the smaller recital room there were a further 187 functions. Festival Hall events include symphony and chamber concerts, song recitals, concerts of light music, jazz sessions, lectures, poetry readings and private balls and banquets. In that year more than a million people paid an average of nearly six shillings each at the box office.

"Instead of blank dates," says Bean, "the hall is booked on six nights a week and Sunday afternoon. Next season I expect every Saturday afternoon to be used, and every Saturday morning for children's concerts. The white elephant has turned a rosy red."

Much of the hall's success, say members of his staff, comes from Bean's determination not only to look after the public but to provide conditions in which the artist can give a perfect performance. So that Toscanini would not have to struggle up three steps to the platform, Bean had a twelve-foot ramp built, and disguised it to

The general manager escorts Princess Margaret. Once he was trapped with the Duke of Edinburgh in the hall's lift

After concerts, Bean congratulates the artists. He meets all performers, from Toscanini to poetry readers and jazz musicians

match the hall. He later offered the ramp to Sir Thomas Beecham when he had leg trouble. Beecham roared an indignant refusal.

When, two years ago, the Vienna State Opera Company were due to perform for a fortnight at the hall, Bean, knowing the stars would be well looked after, sought a way of making the ordinary members of the chorus and orchestra feel at home. He produced a "Welcome to London" booklet in German, with maps and diagrams of the hall, information on shopping, restaurants and currency, transport maps and a street guide.

Most concerts are put on by professional promoters, who pay £220 for each performance. For this, Bean provides the hall, pianos, box office services, ushers, doormen and advance publicity.

No concert hall in any country makes a profit, but the Royal Festival Hall has a better financial record than most. London County Council originally estimated, and were prepared to subsidize, an annual loss of £104,000. So far the cost has been less than £40,000 a year, or one-tenth of a penny on the rates.

An official of the Vienna State Opera, looking at these figures recently, raised his eyebrows and said, "There is a mistake here; surely this loss of forty thousand pounds should be four hundred thousand pounds." In Vienna the state pays more than £1 million a year to subsidize music.

Bean says: "If you put the amount of pleasure provided in the balance sheet, we show a whacking profit." Much of the pleasure, he insists, comes from the hall's architecture. Recently the L.C.C. stopped letting the foyer for exhibitions, on the grounds that the foyer and its uncluttered spaces are a part of the evening's enjoyment for the concert-goers.

As manager, Bean takes pains to deal, often in great detail, with letters of complaint from patrons. Sometimes they lead him to an action that adds to the pleasure of all concert-goers. One letter made him realize that the lighting in the auditorium was too dim to allow some grades of eyesight to follow scores and read programmes in comfort. He has since had the lighting slightly improved on appropriate occasions.

He regrets one letter he sent out. A patron wrote complaining of noisy behaviour by a man sitting in the seat behind. Bean, who has methodical tendencies, checked his files to find that a music critic had been allocated that seat. Then he wrote to the critic, enclosing the letter of complaint.

The critic replied, thanking Bean for the letter, but saying that he had not attended that evening's concert. "I had a gymnastic exercise in grovelling," says Bean.

Though the isolated big occasions draw the crowds to the box office, Bean insists that the smaller concerts and recitals are of greater value. "Our activity aims, not at a few titillating experiences which give a run to the bobby-soxer element in us all, but at the performance where suddenly you are aware of the mind of the composer," he says.

He attended a poetry group meeting a few weeks ago where "the stars really sang." He says: "To my mind the hall would justify its existence if only three people a year were lit up as we were by the combination of poetry and guitar music that night."

BEAN, who has a quietly serious air which frequently dissolves behind an irreverent grin, was born in Colne, Lancashire, in 1900. He was an unwilling student of the piano until the gramophone opened his ears to the beauties of music.

He worked in the circulation department of the *Manchester Guardian*, and in his spare time lectured to village music societies in Lancashire and Cheshire for the Workers' Educational Association, carrying records and equipment in a rucksack. At the beginning of the war he became a member of the Lancashire and Cheshire county music committees.

"Spontaneously and rashly," he applied for the job of manager of the Hallé Orchestra at the end of the war. He was appointed, and helped Sir John Barbirolli to rebuild the Hallé into one of the finest orchestras in Europe.

He has joined his interest in administration to his love for music to keep the Royal Festival Hall running smoothly. "Success depends on careful liaison and clockwork precision which the public is never aware of until it fails."

When things go wrong, the administration is rarely at fault. At one function, Bean was in the hall's ceremonial suite, on an upper floor, with the Duke of Edinburgh. Everybody had synchronized his watch so that at the moment the Duke arrived by lift at the head of the stairway to the foyer, trumpets would play a fanfare. The Duke, Bean and the organizer of the affair stepped into the lift at the pre-ordained moment. Half-way down, the lift stuck. "Only for a few seconds," says Bean, "but it seemed like an instalment of eternity." Luckily, someone restrained the nervous trumpeters, the lift restarted, and the Duke made his entrance as arranged, if not on schedule.

One night Bean sat in his box, enraptured, as was the rest of the audience, by a love duet from Mozart's *Cosi fan tutte*, sung by two stars of the Vienna State Opera. Then, in an alcove at the back of the eighteenth-century scene, there appeared a man in a bowler hat, carrying briefcase and umbrella. "Look," said Bean to a man sitting beside him. "The man from the Prudential." The man in the bowler hat paused, looked at the audience, then walked off on the other side. He was never seen again.

Most newspapers wanted pictures of Toscanini, but the conductor, believing that flashlights affected his eyes, refused. At the last rehearsal, Bean walked into the empty auditorium and spotted a photographer, who had defied the ban, hiding in a corner.

Bean ordered one of his staff to telephone all the national newspapers and invite them to send photographers. Then he appealed to Toscanini's son for help. The son told his father that the leaders of the orchestra wanted souvenir pictures, and Toscanini agreed to pose.

It is Bean's belief that the Festival Hall fails if it does not widen the public's appreciation of music. Box office receipts drop whenever an unfamiliar or modern work is advertised. He has a plan—"you might call it a stunt"—to overcome this.

He is now trying to persuade conductors to play an unfamiliar piece as a surprise item just before the interval of every concert.

"People would listen keenly for a clue as to what was being played," he recently told an acquaintance. "In the interval they would argue about it. Afterwards we could tell them the title of the piece and the composer.

"There is a sporting element in the British public. Why, we might even set up a totalizator in the foyer to take bets on the mystery composer." THE END

FLARE-UP AT MARTBANK

by ***DUDLEY HOYS***

ILLUSTRATED BY LAURENT

The whisper filled the dale—Joe had done this crime. And betrayed the girl he loved

THAT bright Sunday afternoon in February I had been down the dale for a crack with a neighbour. He was running short of hay, and a friend of mine in Lancashire had sent me a letter offering some at a reasonable price.

The crisp, shining weather invited walking. I trudged down by the road, and returned by the track on the far side of the Ire. It twists along above the river and below steepish banks, pricked by dead bracken stems at this time of year. Between the banks and the craggy fell stretch a few rather starved fields and intakes belonging to Martbank, a farmhouse derelict for some while.

Two figures were dawdling around Martbank. Young Dinah Preston I had known since she was a baby. She took after her mother, with her fair hair, good complexion, and wide sincere eyes.

Joe Lindridge was a different story. Not that I held anything against him. But he had come from Gillingdale to be a hired man with Wilson Smith at Hinninghow, and I knew little about him. Some folks said he kept himself to himself. Maybe that was nervousness. Anyway, it had not stopped him from getting engaged to Dinah. I'd been a bit surprised myself when the engagement was announced because Joe had been very thick with another local girl, Nan Creech. But evidently that hadn't been a serious affair.

I smiled and waved, and called out jokingly: "Thinking o' buying the spot?"

They smiled too, at each other. It struck me that love had played a magic trick with the lad. His usually rather expressionless face had animation, and his dark eyes under that crop of brown hair showed a sheen.

"Ay," he said, "we have." And they both burst out laughing at my goggle of amazement.

It certainly was a surprise. I had heard that George Todd, who leased the fields, was giving up the tenancy of them, and that the landlord, living far away, was offering the place for a song. But the cost of putting that house in decent repair might have frightened anyone, let alone newlyweds-to-be.

Dinah said: "We've just managed between us. Scraped up every penny." Yearning came into her voice. "We've got to live somewhere."

I gave a startled whistle. "But you can't live in a spot with a rotten roof and the floors dangerous!"

The yearning was in her voice again, yearning and enthusiasm. "We're going to do the repairs ourselves."

Joe nodded. He had the manner of a dour, determined crusader.

I had to admire their pluck. It would be a long, hard job; and, apart from putting the house in order, there was the problem of getting the land back into good heart. Fields that have been tended and then left to waste seem to grow more jungly than virgin soil. Besides the rioting brackens, the whins had spread themselves in a devilish way. There were tough, spiky stems flourishing everywhere, almost up to the kitchen door.

"Ay," said Joe, following the direction of my glance, "them's gey bad. I'll be having the first burning soon. That'll help."

I wished them the best of luck, and left them to their plans and dreams. For Dinah's sake I hoped things would go well. She was the best type of dale lass.

EXACTLY a month later, on a Sunday afternoon, I finished my nap and went across to the byre to have a look at a heifer that was poorly. A mild breeze ruffled in from the sou'-west, promising moisture soon to bring an end to the dry, cold spell. Smoke was curling on the other side of the river, and beneath it I could detect little twists of flame. Next, I made out the shape of Joe Lindridge. He was launching his first attack on those wicked whins.

I watched him for a minute. Most of us here go in for a bit of burning in the spring, whins or old heather. An oily rag twisted round a length of stiff wire serves as the torch, and the method is to start the fire against the direction of the breeze, to check the speed of spread and thus burn more thoroughly, for whins have a trick of flaring like mad and yet only suffering a surface scorching.

After tending the heifer, in a casual, Sunday afternoon mood I turned to filling a few pot-holes in the stockyard, using stuff we call pinnel, a sort of granulated granite that sets hard. I might have been half-an-hour at it, and when I next came round the corner of the barn to the full view of the fells I had a jolting shock. Across

Joe and Dinah stood together, very still, gazing

Lady Barnett introduces a practical 8-page guide

Brighten your home for Summer

THERE is no better way of celebrating summer than smartening your home. What is more, it can be done cheaply and easily. All the ideas in this Supplement—and there are many to choose from—can brighten your home this month.

The point which I particularly like is that most of them are "quickies." With my TV work and duties as a doctor, magistrate and district councillor, my time for home brightening is strictly limited. But even a complete transformation need not take long.

We used to have a bedroom done entirely in pale cream. It needed a distinctive touch, so I painted the ceiling midnight blue and stuck on stars which I cut from silver foil.

As you will see in the following pages, I firmly believe that the best ideas are often the simplest. Some of my own efforts in this direction have, I admit, startled my husband. One day he arrived at our home, which is the White House at Cossington, near Leicester, and discovered the front door painted a vivid red.

I must emphasize, however, that I'm not an outstanding member of the do-it-yourself brigade. I can cover a lampshade, lay a stair carpet and make bookshelves, but wall-papering, for example, has not as yet been my line. I'm anxious to try it the easy way described by the expert in this Supplement.

Jobs which I really enjoy are those like taking old furniture to pieces. A very ornate Victorian dresser emerged with a modern look when I had dismantled its fittings. The mirror became a handsome wall mirror, and the marble top made a fine pastry slab.

May I add a special plea to husbands? Any project for home brightening should include the kitchen, because that is where the housewife has to spend much of her day.

One kitchen I have seen has a scarlet floor, scarlet-and-white curtains, a ceiling papered with travel posters, varnished over, and table tops in daffodil yellow plastic. That's the sort of bright, cheerful home I admire—and which you can have this summer.

Isobel Barnett

DETACH THIS SUPPLEMENT AND KEEP FOR REFERENCE

Five

HUNTING for ideas in other people's homes is a fascinating hobby. There are several which I have picked up on my travels and used in the White House. For example, in the evening strip lights behind my pelmets shed a warm, cheerful glow over the curtains.

Another idea which I was intrigued to come across in a friend's house was a two-way drawer in a wall between a kitchen and dining-room. The drawer opened from either side of the wall, so that cutlery or crockery put in it after washing up in the kitchen was easily got out again for laying the dining-room table.

Unfortunately, a labour-saver like that is out of the question for me. My home used to be a farmhouse, and was built at least two hundred years ago. The walls are three feet thick in places—as we found when I wanted a pair of alcoves in the drawing-room.

I collect china, and I thought that alcoves fitted with shelves and illuminated would be just right for displaying some of my best pieces.

The builders started knocking away the bricks, and before long came to a massive oak beam about two feet square. I got my alcoves—but if only I'd known that my "simple" idea would upset the house for a fortnight and become a major job of demolition!

SHIRLEY ABICAIR'S NEAT BOOKSHELVES

SINCE her student days at Sydney University, Australia, Shirley Abicair, the zither-girl singer, has collected books. Her London flat on the Chelsea Embankment is not large, and she soon had to look for a place to build shelves.

"I found one—round my bedroom door," she says. "There was a gap just under fourteen inches wide between the hinge side of the door frame and the wall." She decided that she could get seven shelves between the floor and the top of the door, and three more between the door and the ceiling.

She ordered 19 ft. of softwood, 9 in. by 1 in. (at 1s. 8d. a ft.) for the uprights; 19 ft. of 9 in. by ¾ in. (1s. 6d. a ft.) for the shelves, and 10 ft. 6 in. of 2 in. by ¾ in. (4d. a ft.) for use as 7-in. battens to support the shelves.

The first step was to cut the pieces. The longest upright, running from floor to ceiling against the wall, was 10 ft.; the upright at the side of the door frame, 7 ft.; the seven shelves between the door and the wall, 1 ft. each; the shelves over the door, 4 ft. each; and the two vertical divisions between the top shelves, to help take the weight of the books, 1 ft. each.

The framework of shelves and uprights was assembled on the floor. The battens were screwed to the inner sides of the uprights, and the shelves were screwed into position. When the framework had been put up, the top and bottom corners were secured to the wall with five 3-in. angle-brackets.

GIVE YOUR HOME A GAY EXTERIOR

JUNE is an ideal month for brightening that part of the home which is seen by most people—the outside. Exterior woodwork is unlikely to be drier, and there is little chance of night frosts to spoil the painter's efforts.

Differences in architectural design make it hard to generalize on the amount of paint needed for this job, but experience has shown that a total of about one gallon—¼ gal. of undercoating and ¼ gal. of topcoating—is usually sufficient to give two undercoats and a glossy topcoat to the exterior woodwork, gutters and downpipes of a detached bungalow. An average three-bedroom semi-detached house requires two gallons (one gallon of each paint) and a detached house of three storeys needs three gallons.

If, in addition, it is proposed to freshen up walls with cement paint, which is applied like distemper with a wide brush and offers a valuable, waterproof protection, estimate that 7 lb. of cement paint powder mixed with water to the maker's instructions will be enough for two coats on 5 sq. yd. of rough-cast or pebble dash, 11 sq. yd. of bricks or cement rendering, or 15 sq. yd. of asbestos cement sheeting.

The important points with exterior decorating are: (1) the materials must be suitable for outdoor use; (2) they must be of good quality, because poor quality materials are a false economy, and (3) no attempt should be made to apply oil paint on wood which has at any time been creosoted. After a while, the creosote will peel the paint off with almost the same ruthlessness as chemical stripper.

The trend in colours is away from the traditional browns, greens and black.

Character-giving blue, red, cream and white paints are gaining in popularity—but before presenting a terraced or semi-detached property to the world in a bright, original colour scheme, the prudent decorator consults with neighbours, who might themselves be planning schemes which would clash.

Two brushes, a 2 in. and a 1 in., will be needed for each colour of oil paint. Another item which is essential for the exterior decorator is, of course, a ladder.

Ordinary household steps should meet the needs of the bungalow-painter, while a double fourteen-rung ladder, of the type which can be hired from builders for about 7s. 6d. a week, will comfortably reach the gutters of a two-storey house, eighteen feet or so from the ground.

The handling of longer ladders calls for skill, and is better left to an experienced professional.

Briefly, the main rules for handling ladders are these: (a) make sure that the ladder is placed squarely against the wall and that the foot is firmly secured in some way, such as by the weight of a second person standing on the bottom rung, or by tying the bottom rung to a strong stake driven into the ground; (b) never prop the top of a ladder against a freshly painted, slippery surface; (c) for safety, allow at least three rungs to overlap at the top when leaning a ladder against a gutter or similar prominent edge; (d) set the ladder at an angle of about seventy degrees to the ground, because if the angle is less than this, it is difficult to keep one's balance, and at greater angles the ladder is disconcertingly springy; (e) lower the upper part of an extension ladder before attempting to move it, and finally (f) postpone all thought of using high ladders if strong winds are blowing.

Once the ladder is safely in position, a start can be made on cleaning and preparing for the painting.

Remove moss, dirt and leaves from the gutters with a hard-bristle brush or a garden trowel, taking care than none of the rubbish blocks the downpipes.

Since most guttering and piping is made of cast iron, which corrodes, it will almost certainly be necessary to deal with rust. Clean the rusty patches with a wire brush or emery-paper until the bare metal is exposed. Then protect against further trouble by using an old paint brush to apply rust-inhibitor, of which several brands are in the shops.

The same fluid might also ease the unscrewing of fastening nuts if the guttering is so badly corroded that lengths have to be replaced. The problem of nuts which still put up a fight after this treatment can be solved drastically, but effectively, by cutting through their bolts with a hacksaw.

Having made the ascent to the guttering, take the opportunity of preparing the nearby woodwork for repainting.

Although even large areas of old paint can be softened by applying a chemical remover, probably the most satisfactory and economical proposition outdoors is a blow-lamp, used in conjunction with a metal scraper.

After being stripped of paint, all woodwork should be rubbed down thoroughly with glasspaper, in the direction of the grain. Dust which collects in corners and could spoil the paint brush when painting begins; is best flicked out of harm's way with a soft brush.

Fill in holes, gaping joins and cracks with putty or a proprietary filler, pressing it well into the cavities with the edge or point of a putty knife and producing a smooth finish with the face of the knife. Later, when the filler has hardened, finish off with a glasspaper rub.

Knots in wood are major hazards for the painter. Their power to blister paint by exuding resin should not be under-estimated. Curb it by covering them with two thin coats of shellac knotting apiece. A quarter of a pint of the knotting, which must be kept in a glass bottle—it darkens in a tin—is the most that need be bought at a time.

Probably only a small quantity of primer will be needed, too. Bare metal or new wood must have a coating of primer before being painted, and a top-quality brand, consisting chiefly of linseed oil and lead—red lead, white, or a blend of both—is a worthwhile investment. It penetrates into the wood, forming a tight-gripping foundation for the subsequent painting. Twenty-four hours is the time-lapse for it to dry properly before an undercoat is applied: forty-eight hours if the weather is cold and damp.

When doing the outside of a down-pipe which is close to a wall, slip a sheet of cardboard, metal or plywood between the pipe and the wall to shield the wall from splashes.

Painting doors, gates and exterior timber generally is a straightforward matter in the logical sequence of undercoats followed by a topcoat, with a drying period of twenty-four hours between each coat.

A problem sometimes occurs when the beginner studies a window-frame for the first time as a painter and has to decide which surfaces count as being outside, and which are inside.

The way to find out is to open the windows. The edges which are then visible from the outside should be regarded as being outside.

Prepare a sash frame for painting by opening

ingenious ideas from the stars

PETER CUSHING'S JUNK ROOM DEN

"MY house in West London," says actor Peter Cushing, "has a room which is only ten feet by eight feet. It is so small that at first I thought it could only be used for storing junk."

With a little ingenuity, however, he turned it into a comfortable den-cum-dressing-room. He bought a bookshelf 5 ft. long and 4 ft. high for 19s. second-hand. Helped by his wife, he rubbed it down with glasspaper and gave it two coats of white paint. He uses the top of the bookcase for books. The four shelves of the case—covered with a curtain of cheerful red and white towelling, hung on an expanding curtain wire—act as shoe-racks.

As a further space-saver, he put a built-in dressing table in a corner. The top, which was simply a triangular sheet of deal, cost 2s. 6d., ready cut. He supported it on two strips of wood 2 in. wide and 1 in. thick which he screwed to the walls in the corner, parallel with the floor at a height of 30 in. Thin strips of wooden beading nailed round the upper edges of the table top and beneath the front edge produced a neat finish. To make the room as light as possible, he also painted the table white.

"Using an expanding wire, we hung another curtain, of the same red and white fabric, over the front of the dressing table," says Cushing.

With the rest of the material, his wife then completed the furnishing of his den by making a loose cover for his armchair.

YOLANDE DONLAN BUILDS A DESK

BLONDE actress Yolande Donlan needed a small, compact desk for writing letters in her London home. "I could not find exactly what I wanted in the shops, so I decided to make one myself," she says.

She paid £6 for a pair of second-hand metal filing cabinets. Each had nine drawers and was 30 in. high, 1 ft. wide and 18 in. deep. Placed 2 ft. apart, they made ideal pedestals.

She thought of using polished plywood, hardboard or a sheet of plastic for the top of the desk, but finally chose plate glass. A sheet which bridged the cabinets and covered them completely cost, with bevelled edges, 36s.

"Then I realized that I would be sitting in my own light," she recalls. "The place where I wanted the desk was at the end of a long, narrow room, about twenty feet from the nearest window." She knew that she could solve the lighting problem by putting a wall-mirror above the desk, but found that a new one of the size she needed—4 ft. by 6 ft.—could cost about £25.

However, she bought a mirror second-hand for £8 10s. The gilt frame had some chips and cracks, but it was repaired with plaster filler and, when dry, done over with gold paint.

Fixing the mirror consisted of leaning it against the wall, while supported on a stout table, so that the places for the holding screws could be marked. Four 3-in. screws, in holes fitted with wooden plugs, were sufficient to hold the mirror.

JOHN SLATER'S CHINA CABINETS

THE first time John Slater, the actor and TV storyteller, entered his house at Totteridge, Hertfordshire, he saw that the door of one large room was flanked by a pair of forbidding-looking bookcases, each 7 ft. tall and painted black. "Those," he said, "will have to come out."

But the next day he thought of a means of turning them into china cabinets. On the lower half of each bookcase he fixed a plywood door, 36 in. high, which hid the lowest shelf and reached the second shelf. The plywood was cut to the exact size of the aperture, allowing the width of a sawcut for clearance. A simple framework of wood strip, 2 in. wide and ¼ in. thick, nailed round the inner edges kept the door in shape. Cheap hinges and catches came from a local ironmonger.

Next, Slater took out the wooden shelves from the top halves of the bookcases (two shelves per case) and bought plate glass replacements of the same size. While at his glass merchants, he also bought two sheets of ordinary window glass, each 22 in. by 40 in., for making doors for the upper halves.

The wooden door frames, with mitred corners, were made of moulding, 3 in. wide and ready slotted to hold the glass. Since putty sticks better to paint than to glass, it was necessary to edge the glass on both sides with narrow strips of paint before securing it in the frames with putty. The glass doors were also fitted with hinges and catches.

ZOE NEWTON SAWS DOORS IN HALF

WHEN Zoe Newton, the photographers' model, moved into her London flat last summer, she liked everything except the doors. "They looked old-fashioned, swung too wide, and if I was holding a tray, they were much too heavy to be pushed open with a toe," she says.

At her suggestion, her husband, David Barclay, who is an interior decorator, agreed to cut three of them into halves—vertically. The resulting pairs of tall, slim panels give her flat the type of doors seen in palaces.

The vertical cuts, which can be made on any door of normal size, were done by taking each door off its hinges and supporting it on four chairs, one at each corner. The centre lines, marked on both sides with a pencil, were sawn through.

After the sawn edges had been smoothed with glasspaper, the lock was taken out and the hole filled with a block of wood surrounded by putty.

One half of the door had, of course, got hinges already, but it was necessary to fix a new pair of hinges, in recesses chiselled ¼ in. deep, on the other half.

Instead of troubling to fit a new lock, a ball-catch was screwed into recesses chiselled in the newly sawn edges. An inch-wide strip of wooden moulding nailed along one edge of each half covered the vertical gap on opposite sides. "Our final touches," says Zoe, "were to cover each door with hardboard, paint it lavender grey and fit bronze handles."

both sashes as far as they will go. Paint as much as possible of the lower end of the rear sash. Next, do the whole of the front sash and the top, bottom and inner sides of the window-frame which are hidden when the sashes are closed. Almost close the sashes to paint the upper part of the rear sash and the remainder of the inner sides of the frame. Leave the sashes like this to dry, and paint the rest of the surrounding frame.

With casement frames, start on the edges round each movable window, followed by the remainder of each window. Afterwards, do the main surrounding frame and sill.

Metal frames which are rusted require the same care as corroded gutters or piping. If the putty is old and cracked, allowing water to seep through to the metal beneath, it ought to be taken out and replaced.

Such treatment, as a preliminary to two undercoats and a glossy finish containing white lead, should guarantee that a year or two will pass before the paint brushes need be got out again.

JOHN BULL ANNOUNCES

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Put Summer Colour in Your

If the bright sunshine outside throws a shadow in your rooms, bring the sparkle indoors. These hints are cheap—and easy

TRANSFORM THREE ROOMS

COMFORT IN THE KITCHEN

Fitted furniture in the kitchen was once the dream of almost every housewife. Today, with new materials, build-it-yourself kits and time-saving tools, few of these fittings are beyond the skill of the handy husband. A drop-down table, fitted to the wall, makes a useful accessory for quick breakfasts, morning coffee or impromptu snacks. For the housewife with a small kitchen it will prove a boon. Ingenious fittings are one way of making a kitchen seem bigger; bright, light and cheerful colour schemes are another. Curtains can be lined with a patterned fabric to provide an inexpensive colour change, inside and out. A pleasing variation may also be obtained by repainting kitchen units in deep and light tones of the same colour—the doors and panels in deep blue, for instance, and the frames in a lighter shade.

A BRIGHTER BEDROOM

An uninteresting alcove in a bedroom can be improved by turning it into a dressing recess. A simple shelf, with a glass or plastic top, is fitted from wall to wall, and a box-pleated curtain made to hang below, matching the bedspread. Use a bold paper on the wall of the recess to emphasize the corner. Add a mirror, and a small table lamp if the corner is dark. A child's bedroom can be brightened by making pelmets out of brightly coloured felt, cut to points. On the points hang bells, jester-fashion. The bells will jingle when the curtains are drawn. An attractive bedhead can be made cheaply from a length of garden trellis, smoothed with sandpaper and painted a contrasting colour. The trellis should be long enough to continue over the bedside cupboards or tables. If a more luxurious effect is wanted, outline the trellis in draped material to match the bedspread and dressing-table hangings.

LIVING-ROOM EXPERIMENT

Colour in a living-room floor surround will bring out the less obtrusive tones in a carpet and provide a delicate link between wall and floor schemes. When introducing a new colour into a room it is a good idea to use it first in a lampshade, cushion cover or rug. This will avoid the danger of causing a clash with pieces that cannot be renewed; a new colour scheme can then be developed more safely. When buying dining-room chairs it is advisable to invest in those with tight covers that can be detached for cleaning or replacing. When making chair or cushion covers use zipp fasteners or press-studs: the fabric can then be removed quite easily. Plastic-coated Vynide makes an admirable covering for chair cushions. It is available in gay, striped patterns, and is washable.

NEW PATTERNS FOR GAIETY

A FEW good ideas, a little ingenuity and some cheery, colourful fabrics can soon give a lounge-dining-room a gay, summer-time look.

Here, the lounge and dining sections in this composite room have been cleverly separated by using contrasting decorations on walls and ceiling. The illusion of two rooms, with the advantages of one, has been maintained in different floor coverings; the sideboard, at right angles to the wall, forms a partition, with climbing plants trained on cords to the ceiling.

Picture rails have been removed, creating an impression of height and airiness. The use of matching fabrics brings a colourful link to the table lamp, occasional table and curtains. A jardinière of plants and flowers serves the dual purpose of hiding an unsightly empty grate and bringing another splash of colour into the room. Above the fireplace hang prints mounted on coloured felt. Horse brasses decorate the window pelmet.

In the kitchen, an awning over the window inside gives a light, Continental touch. Perforated hardboard, gaily painted, holds anything from onions to soup ladle.

Note the multi-coloured banisters in the hall and neatly hung pictures up the stairs.

TWELVE DISTINCTIVE TOUCHES

Ideas which are out of the ordinary can make your home more practical and more attractive at very little cost

- An ordnance map of your district makes an interesting and unusual mural; if you have a glass-topped table, place the map under the glass.
- Turn your doors into flush doors by covering them with hardboard. This may be painted or papered to tone in with the room.
- Small prints are available of London Transport's advertisement paintings and the country scenes in railway carriages. These, mounted on coloured paper or framed in passe partout, make inexpensive wall decorations.
- Fit fluorescent lights inside dark cupboards, fitting a contact switch so that the light comes on when the cupboard door is opened.
- A hall may be turned into a room, ideal as a children's playroom in winter, by fitting curtains across the front door and flanking windows.
- Space may be added to a small hall by removing the cupboard under the stairs. Paint the walls in cheerful colours to create lightness.
- Disguise an imperfect or badly shaped wall with a boldly patterned paper.
- Repaint woodwork white, if it is cream or off-white. This will help to bring out the deeper colours of the room.
- Three walls patterned and one plain is a good variation on the more familiar scheme of one patterned and three plain.
- Give a unique touch to a circular table by using wedge-shaped mats pointing to the centre.
- Brighten a fireplace in summer by brushing away the soot and distempering the firebricks with a colour that suits the room.
- If you have a wardrobe with drawers and mirror—but have no room for a dressing-table—add a sliding top to the top drawer on which to rest cosmetics.

How to tackle the

HANGING THE WALLPAPER

WALLPAPERING is not such a long and complicated job as many people fear. A professional paperhanger must, of course, acquire special skill, but there are many easy ways by which anyone can soon achieve excellent results—providing the first attempt is not too ambitious.

Practise on a smallish room. *Then* do a living-room or hall.

The range of papers in the shops will spur you on. It has never been bigger. British manufacturers, who change their designs every two years, launched their new ones only a few months ago. American-style papers are also available. With their large, bold patterns

Alec Hodnett, instructor at the London Northern Polytechnic, smoothes the paper with a brush

they are a strong inducement to try those two-paper schemes which are now very popular.

As a general rule, when using two papers in a room—and two are enough for any scheme—have the bolder pattern in the most prominent part, round a fireplace, or at the head of a bed. Whatever your choice, buy enough paper to finish the room. Another batch may differ slightly in shade.

British papers, except expensive hand-printed ones, come in rolls 11½ yd. long and 21 in. wide. A roll with a small pattern, which is the best kind for a beginner to use, will cover about 55 sq. ft., taking into account the unavoidable wastage at the tops and bottoms of pieces.

When buying, save time later on by asking the retailer to trim the edges of the rolls to make them ready for hanging. Shops charge 2d. or 3d. a roll for this service.

As with every type of decorating, success in paper depends a great deal on thorough preparatory work. After moving floor coverings and furniture out of the way, scrape off any loose distemper or emulsion paint and smooth the edges of the patches with glasspaper. Repair cracks with plaster or plastic filler.

Old wallpaper can be peeled off surprisingly quickly by giving it liberal soakings with a rag dipped in warm water, leaving it for ten minutes and using a scraper.

Mix your bucket of paste by allowing 1 lb. of ordinary wallpaper paste for every four rolls of paper. If you have bought the new non-staining cellulose crystals, which are a boon to amateurs, they will need to stand for about fifteen minutes before use. In this time, get ready your table—the larger the better, because a large table simplifies pasting. Also a brush for the paste—an old distemper brush, properly cleaned, will do; scissors to cut the wallpaper and a soft-bristle brush for smoothing the paper when it is on the wall. If the paper is of an ordinary type which will stand a little friction, a pad of clean, soft rags will do.

You will also find very useful a bowl of clean water for rinsing paste off your hands, and a towel.

Should you have a long stretch of wall to cover, speed the preparation of the paper by cutting four or five pieces at a time, and putting them by for use in the order in which they were cut. It may be necessary to cut some of the pieces as much as twenty inches longer than the height of the wall, merely to ensure the continuity of the pattern.

In any case, there should be at least two extra inches at the top and bottom of each piece to allow for neat trimming when the paper has been put up on the wall.

Then comes the problem which is apt to make amateurs despair—getting the vital first piece into position on the wall so that its edges are absolutely vertical.

This, however, can be arranged in a matter of seconds. Attach a plumb bob, or any small, heavy weight to a long piece of string and rub the string with chalk. Suspend the weight against the wall by holding the other end of the string at the picture rail—or wherever the top of the paper will be—and pressing the weighted end against the bottom of the wall, either by using your foot, or by getting the help of someone else. Then pluck the middle of the string like a harp string, and there, on the wall, will be a vertical chalk line which can afterwards be rubbed off and leave no trace.

Lay the first piece of paper face downwards on the table and paste the back evenly with firm, rapid strokes, folding the ends over towards the middle for easier handling later. Heavy papers must be limp with paste before

Close the gap between papers by sliding with a gentle pressure

they are hung, so they will probably need two coats.

You might also like to give the wall itself a thin coat of paste. This is frowned on by professionals as very unethical, but amateurs find it a useful means of making doubly sure that there is an adequate spread of paste.

Everything is now ready for hanging

Allow two extra inches at the top and bottom for neat trimming

the first piece. Pick it off the table by holding the top end of the paper, a few inches below the corners. Hold it with one edge over the chalk line and press it into position. Using the brush or pad of rags, smooth out air blisters by working from the centre of the piece, outwards to the edges.

When this has been done, run the back of a scissor blade along the top and bottom edges to mark the lines along which the paper needs to be cut for a neat finish.

Follow the same routine for hanging the second piece, but when pressing it against the wall, keep it about one-eighth of an inch away from the nearest edge of the first piece. Then, with a gentle pressure of the hands, close the gap by *sliding* the second piece up to the first. With a little practice, you can soon obtain joins which will defy detection.

You will also find when papering that two other difficulties arise—but there are simple ways of solving these, too.

The first difficulty is the common one of getting the paper round corners. Many corners have some small fault, such as being a degree or two out of the vertical, and the newcomer to papering who tries to wrap large pieces round them has to cope with tedious rucks and tears. Avoid this dilemma by planning or specially cutting the pieces so that it will not be necessary to go round an outward corner by more than two inches at the most, or round an inward corner by more than half an inch.

The second type of difficulty is in getting the paper round an awkward obstruction, like a light switch. The easiest way of doing this is to hold the piece, unpasted, against the wall, and make a small hole which corresponds to the centre of the switch. Then lay the paper on the table and make about a dozen cuts, like the spokes of a wheel, radiating from the original hole to open up a larger hole approximately twice the diameter of the switch. Paste the paper, hang it in position and trim off the jagged edges round the switch.

Difficulty number three concerns that long piece of paper, sometimes as much as twenty feet long, which is needed for papering the hall. It stretches from the upper landing almost to the bottom of the stairs.

The folding and handling of a piece of that length when it is soft and heavy with paste is, I'm afraid, entirely a matter of practice. But a quick, foolproof means of papering that wall—which is often the largest, and barest, in the house—is to use two contrasting papers. Paste them in pieces, each about twice as long as its width, and obtain a chequer-board effect. The centre of one of the middle pieces is

A few cuts before the paper is hung overcome obstacles easily

an ideal place for fixing a picture, a potted plant, or some other decoration.

Those, then, are the simplest methods of hanging wallpaper, but two points require warnings. Firstly, don't try to hang paper on a painted surface in a steamy room, because you will have great difficulty in making it stay up. Secondly, when you have finished papering, make sure that all surplus paste has been wiped from woodwork. If left to dry it can cause paint to come off in flakes.

YOUR PLACE IN THE SUN

A coat of whitewash and paint could make a sun-trap

SUMMER is coming, and that warm outside corner can be quickly turned into a comfortable sun-trap.

Wooden trellis, costing about 10s. for a 12-ft. length, 2 ft. wide, makes an effective windbreak when covered with a climbing plant like clematis, honeysuckle or wistaria.

A coat of whitewash gives a new look to old brickwork, though cement paint—pale pink or a rich yellow is more cheerful than green or blue—can be worth the extra cost because it is weatherproof. Before applying whitewash or paint, prepare the surface by cleaning away all dirt and grit. Cement paint should not be used during frosty weather or rain.

The most labour-saving furniture is, of course, the kind for leaving out in all weathers. Second-hand shops often have cheap Victorian wrought-iron chairs which can be smartened with paint and cushions. Awning cloth in red, blue or white stripes makes gay upholstery. There is also a new plastic covering in bright colours, and it can be wiped.

Shops have tables with collapsible metal legs and separate tops for easy storage. Alternatively, a flap table fixed to a wall is a good space-saver. Use a board about 2 ft. by 3 ft. for the table-top and screw two 3-in. hinges along one of the edges, 6 in. from each end. Secure the hinges to the wall, at a height of 30 in. from the ground, by knocking holes to take the screws, filling the holes with wood—slim wooden tubes, specially designed for this purpose, are on the market—and inserting the screws into the wood.

The table can be kept firmly horizontal by screwing in a hook at one of the outer corners and linking it by a chain with another hook, some 3 ft. higher, which has been screwed into a wooden plug let into the wall.

job like an expert

NEW LOOK IN FLOORING

AMONG the quickest and simplest floorings to lay are strips or tiles of lino or plastic. Tiles are apt to be more expensive than strips, but they offer scope for original designs. Whatever type is chosen, a first-class job can be made of laying it on any floor.

The problem of deciding how much to buy is best solved by drawing a rough plan, marked with the main dimensions, and seeking the help of an experienced salesman.

Lino should never be laid on a damp floor. Therefore, a newly made concrete floor needs to be thoroughly dry before it is covered. Wooden floors should be prepared by nailing loose boards and hammering down nail heads.

Lino is made from cork, linseed oil, gums and resins, and is brittle in cold weather. Keep it in a warm room for twenty-four hours before unrolling.

Arrange to lay it so that any cuts and joins come at right-angles to the main source of light. They will then be less noticeable. A simple method of cutting to the shapes of awkward corners like doors and fireplaces is to make a pattern in newspaper or thin cardboard, paste it on the surface of the lino and cut round it.

Straight lengths can be cut quickly by cutting the lino only half-way through its thickness. Bend it back so that it splits along the cut. Then sever the hessian backing.

Lino expands slightly. To deal with this, allow the pieces to overlap a little. When they have been down for about a fortnight, use the edge of each upper piece as a guide for cutting through the lower piece. When the surplus has been removed from the lower piece, the upper piece will fall into place with a perfect, professional fit.

Half-inch sprigs (wedge-shaped headless nails) are an easy means of securing lino to wooden floors. If adhesive is used, allow for the seasonal expansion and contraction of the floorboards by first gluing paper felt to the boards and mounting the lino on the felt.

Adhesives can also fix lino or plastic to concrete floors, but it is important to observe the correct drying times, according to the various brands, before making the final bonds.

Once laid, lino or plastic can be kept clean with mild soap or soapless detergents. Strong soaps, soda or washing powders are harmful.

Old lino can be repainted, but remember that the paint will take a day or so to dry properly. Prepare the lino for painting by wiping off all the wax polish with warm soapy water. Apply the paint evenly and thinly; two coats may be needed. When dry, protect the surface with a fresh application of wax polish.

A LICK OF PAINT

THESE days, painting need not take a long time, or cause an upheaval in the home. There are chemical strippers which peel off old paint layers thick in a matter of minutes; drip-proof paints which protect the efforts of even the most slap-happy beginner; paints which dry in an hour or less, and rollers which make it possible to redecorate a room in a couple of evenings.

Unchanged, however, are the two basic secrets of easy, successful painting. They are (1) a thorough preparation of the surface to be painted, and (2) the use of good quality paint and equipment.

As a rough guide when buying paint, estimate that one quart will cover about fourteen square yards. This figure, of course, varies according to the consistency of the paint and the surface to be covered. On a well-prepared surface which has already received one coat, a quart could stretch to sixteen square yards.

Grease and water are paint's greatest and most frequent enemies. They stop it from drying, hardening and adhering properly. Remove wax polish with glasspaper moistened with paraffin. And if the room is, for example, a kitchen, where there have been fumes from cooking, it is particularly necessary to clean the walls and ceiling with a solution of decorator's sugar soap, allowing a packet to two gallons of warm water.

Above all, the way to guarantee a professional-looking finish with any kind of painting is to smooth the surface and fill in cracks with plastic wood or a proprietary filler.

Halve the time normally required for doing a ceiling and walls by using a roller. An 8-in. roller, big enough to speed the redecorating of an average room, can cost just over £1, together with its tray.

Pour the paint, or distemper, into the tray and rub the roller downwards to get it completely covered. For the best results with a ceiling, start above the windows which give the main source of light and work away from them, so that the final strokes are at right-angles to them. Use an ordinary paintbrush for cornices, small mouldings, corners and other awkward spots.

Two brushes, a 1½ in. and a ¾ in., should meet the needs of the home painter who is also using a roller. The smaller size is ideal for intricate jobs such as picture rails—which, if they have previously been given a dark stain, can, like other stained surfaces, be prepared very effectively for the top coat by using aluminium paint as an undercoat.

Beginners sometimes forget that each type of paint has its own characteristics and needs to be handled accordingly. An undercoat has to be brushed out firmly and finished lightly to prevent brush-marks from showing through the top coat. Flat wall paints and enamels should be applied quickly, while high-gloss enamels call for carefully applied, generous coats.

By far the quickest way of getting through painting is to follow a system. When doing a window-frame, start with the insides of the frame and progress outwards. A piece of cardboard or thin metal sheet held along the join between the frame and the glass will shield the glass from unwanted paint.

Tackle doors with another routine. Do the panels, tops, middle pieces, bottoms and sides—in that order. If a two-colour scheme is wanted, paint the panels and allow them to dry. Apply the companion colour with a brush which is well charged with paint and drawn firmly and smoothly to within half an inch round the edge of each panel. Then, keeping the brush handle pointing away from the edge, spread the paint up to it.

It is always a worthwhile precaution to keep a bottle of paraffin or turps substitute and a rag handy for cleaning up any splashes of paint the moment they occur. Streaks on the floor while painting skirtings can often be avoided by slipping newspaper between the skirting and the floorboards.

When work is finished for the day, a jam jar filled with enough water to cover the bristles is an excellent way of storing a paintbrush ready for use next day.

Take care of the roller, if it has been used for distemper or an emulsion paint, by washing it in warm water. If an oil paint has been used, squeeze off as much as possible—wear rubber gloves for this—and clean the roller with paraffin or turps substitute, followed by a wash in warm water with a little detergent.

A paint brush used for oil paint and about to be put away for a long while is grateful for the same treatment.

As for the paint itself, a drop or two of turps substitute or linseed oil poured in before closing the tin will make sure that it can be used again at once. No skin will form.

BRIGHTER LIGHTS

ONE of the quickest and surest ways of giving a home a new look is a change of lighting. At night, rooms are gay, restful or gloomy, according to how they are lit—and creating a cheerful effect can be done without inconvenience or great expense.

Fixing brackets and other lamp fittings on walls, for example, used to involve laborious, and sometimes not entirely successful, attempts at concealing the wiring in the wall. Now, a time- and money-saving idea is to leave wiring exposed.

To appreciate the difference made by even one more light in a room, experiment by trying different positions for a table lamp.

It has been estimated that, ideally, an average, three-bedroom house with a garage should have twenty-one lighting sockets and twenty-two points. Here, for the home with at least one plug in most rooms, are ideas which an electrician can carry out without extra basic wiring.

In a living-room in which the mantelshelf is of wood, a hardboard pelmet 6 in. wide along the edge can conceal two pear-shaped lamps on sideways mountings beneath. In summer, white lamps make the hearth a showplace for flower arrangements; in winter, orange-coloured lamps add to the fireside glow.

Effective background lighting for TV can come from fluorescent or tubular filament lamps which floodlight curtains from beneath the pelmets. If the board on which the curtain rails are mounted is not wide enough to take the lamps and fittings, fix a wider board over the existing one and tack the pelmet to the edge of it. Allow a gap of 6 in. between the lamps and the curtains so that the light spreads.

Have fluorescent lamps in the kitchen, under cupboards and shelves which overhang working areas. If there is a dining alcove, light it with filament lamps and use fluorescent fittings for the rest of the kitchen. Two kinds of light foster the illusion of different rooms.

One or more hooded spotlamps on the ceiling give fresh interest to a hall or landing, by lighting a picture, or a row of plants, with dramatic effect.

Make a small bedroom seem bigger by having a band of light right across the bedhead wall with warm-white fluorescent lamps. Mask them with a baffle 6 in. deep and 4 in. to 6 in. from the wall, but leave it open at the top and bottom to let the light spread up and down. Such a fitment, about 6½ ft. up a wall, is ideal for reading in bed and provides general lighting for the entire room.

A few basic rules apply to all lighting schemes in the home. They are: (1) Aim at flexibility, so that there are enough points to change the position of floor and table standards from time to time. (2) Try to break away from the convention of relying on ceiling fittings for light; side lamps are more flattering to furniture. (3) Avoid glare from bare bulbs, over-thin shades or light reflected from highly polished surfaces. (4) Don't bottle up light. Avoid shades which are too deep, too narrow or too dark in colour. Shades for floor and table standards should be open at the top and wide at the bottom, and be light-coloured inside for a good downward reflection. (5) It is impossible to have too much light. A good intensity for reading, sewing and similar jobs is the light obtained at 2 ft. from a 100-watt lamp in a white-lined shade.

The following table shows the amount of light needed for a home to be seen at its best.

Column A refers to filament lamps, and column B to fluorescent. The total wattage shown can, of course, be split up among two or more lamps, but smaller lamps are relatively less efficient than larger ones. One 100-watt lamp gives roughly the same light output at two 60-watts, or three 40 watts.

Location	*Wattage Total* A	B
Hall	60	30
Landing	60	30
Stairs	60	30
Passages	60	30
Living-room	120	80
Easy chairs	100	30
Writing-table	100	30
Sewing-table	100	30
Dining-room	120	80
Easy chairs	100	40
Kitchen	200	80
Bedrooms (general) ...	100	40
Bedhead	60	30
Mirror	120	40
Child's bedroom ...	150	80
Table	100	40
Bathroom	100	40
Mirror	60	40
Garage	150	80
Working bench ...	100	40
Outhouse	40	30
Loft	40	30
Cellar	40	30

How to use paper, paint—and plants

EIGHT EASY-TO-GROW EVERGREENS

POTTED evergreens add splashes of colour to a home. Florists now offer about sixty varieties originating from Africa, India and other countries. Most of them need watering only twice a week.

They prefer a constant temperature of between fifty-five and sixty degrees Fahrenheit, and in order to breathe easily, like to have dust washed or sprayed from their leaves. They dislike direct heat, direct sunshine and over-generous watering.

Your choice depends mainly on the room where the plants will be put. Here are some popular and easily maintained varieties.

FOR THE LIVING-ROOM

Peperomia Saundersii is a short, stubby plant, with wide oval leaves striped in yellow and green. It is a particularly hardy plant

Hedera Helix "Chicago" is hardy, with many small ivy-like leaves. Climbs, and can be trained over sticks and in baskets

Sansevieria has narrow fleshy upright leaves which are edged with yellow. Almost impossible to kill if kept very dry

Cissus Antarctica is a good hardy climber with medium sized green leaves. The roots should be kept thoroughly moist

FOR DARK CORNERS

Philodendron Scandens is one of the hardiest of all house plants. Has trailing heart shaped leaves and likes shade and moisture

Ficus Pumila is a quick-growing climber and trailer with small green leaves. Roots must be kept thoroughly moist

FOR THE BATHROOM

Ficus Elastica Decora (or the Rubber Plant) has dark green glossy leaves on a tall stem. Does best away from sunlight

FOR THE KITCHEN

Rhoicissus Rhomboidea will stand heat and steam and is very hardy. It has small green leaves with tendrils which help it to climb

MAKE A MINIATURE GARDEN—IN A BOWL

A SHALLOW bowl or meat dish filled with an inch-thick layer of small stones and a fairly sandy compost mixture forms the basis of an attractive miniature garden. All plants must be to scale. The background can be a dwarf cypress, juniper or Chinese rhododendron (between 6 and 8 in.), while *rosa rouletti*, a dwarf rose, is suitable for the foreground. Miniature bulbs can be had with 2-in. stems; also use moss, alpines and coloured sand or rock chips. These plants must not have too much water.

WHAT YOU NEED

JOB	SIZE	QUANTITY
Painting		
Undercoat	7 sq. yd.	1 pint
Oilbound topcoat	5 sq. yd.	1 pint
Emulsion paint	6 sq. yd.	1 pint
Varnishing	5 sq. yd.	1 pint
Staining wood	8 sq. yd.	1 pint
Painting linoleum	5 sq. yd.	1 pint
Distempering	1 sq. yd.	1 lb.
Stripping paint with chemical remover	Door, windows and skirting in average room	1 pint
Rust prevention on metal window frames	3 average window frames	½ pint of rust preventive
Glazing a window	3 ft. by 4 ft.	2 lb. putty
Plastering a wall, etc.	1 sq. yd., thickness ½ in.	7 lb.
Re-pointing brickwork	6 ft. by 3 ft.	¼ 2-gal. bucket of sand ⅛ bucket of cement
Rough-casting brickwork	6 ft. by 3 ft.	¼ 2-gal. bucket of sand ¼ bucket of cement ¼ bucket of gravel 3 lb. of lime
Concreting a garage floor	18 ft. by 10 ft., thickness 3 in.	9 bags cement 1 cu. yd. sand 1½ cu. yd. shingle 22 buckets of water
Concreting paths, steps, etc.	Per 5 sq. ft., thickness 3 in.	1 2-gal. bucket of cement (equals ¼ 112-lb. bag) 2 buckets damp sand (equals $\frac{1}{10}$ of cu. yd.) 3 buckets of shingle (equals $\frac{1}{28}$ cu. yd.) ⅛ bucket of water

FORTY-FIVE COLOUR SCHEMES TO CHOOSE

WALLS	FLOOR	CEILING	FABRICS
HALL, STAIRCASE AND LANDING			
Old gold	Brown	Cream	Primrose
Primrose	Lime green	Ivory	Scarlet
Light grey	Beige	Pale green	Pillar box red
Turquoise	Red	Off-white	Chocolate
Royal blue	Rust	White	Yellow
Lime green	Rust	Ivory	Brown
White	Scarlet	Grey	Deep red
LIVING-ROOM			
Deep cream	Beige	Honeysuckle	Tan
Mustard yellow	Slate blue	Sky blue	Rust
Lime green	Rust	Primrose	Daffodil
Turquoise	Chocolate	Yellow	Deep blue
Slate blue	Tan	White	Dark red
Rose	Turquoise	White	Brown
Red/grey stripes	Deep blue	White	Old gold
Grey	Deep blue	White	Daffodil
Mushroom	Mustard	White	Rust
Biscuit	Orange	Ivory	Tan
DINING-ROOM			
Cream	Rust	Pale peach	Old gold
Primrose	Chocolate	Ivory	Light grey
Old gold	Maroon	White	Red
Pale green	Bottle green	White	Cherry
Apple green	Mustard	Ivory	Rust
White	Chocolate	Lime green	Rust
KITCHEN			
Primrose	Grey	Ivory	Turquoise
Yellow ochre	Black	Pale blue	Bright red
White	Mushroom	Rose	Chequerboard
Grey	Green	White	Primrose
Beige	Brick red	White	Red
Kingfisher blue	Royal blue	Primrose	White
BEDROOM			
Rose	Royal blue	White	Green/white stripes
Oyster	Deep grey	Pink	Rose
Apple green	Brown	White	Red
Turquoise	Blue	Ivory	Yellow
Delft blue	Royal blue	Cream	Grey
Dove grey	Chocolate	Ivory	Wedgwood blue
Mushroom	Deep green	White	Pillar box
CHILD'S BEDROOM			
Pale blue	Foxglove pink	Off-white	Bunting yellow
Blue/white stripes	Yellow	Mauve	Royal blue
Honeysuckle	Beige	Ivory	Rust
Cream	White	Rose	Deep red
Lime green	Bottle green	Ivory	Yellow
BATHROOM			
Primrose	Black	White	Royal blue
Deep turquoise	Bottle green	Lime green	Mushroom
Peach	Black	Peach	White
Lime green	Maroon	Primrose	White

PAPER RECKONER FOR WALLS—AND CEILINGS

HEIGHT IN FEET OF WALL FROM SKIRTING	NUMBER OF ROLLS OF WALLPAPER NEEDED															
Between 10½ and 11	5	6	7	7	8	9	9	10	11	11	12	13	13	14	15	16
" 10 and 10½	5	5	6	7	8	8	9	10	10	11	12	12	13	14	14	15
" 9½ and 10	5	5	6	7	7	8	9	9	10	10	11	12	12	13	14	14
" 9 and 9½	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	13
" 8½ and 9	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13
" 8 and 8½	4	5	5	6	6	7	7	8	8	9	9	10	10	11	12	13
" 7½ and 8	4	4	5	5	6	6	7	8	8	9	9	10	10	11	11	12
" 7 and 7½	4	4	5	5	6	6	7	7	8	8	9	9	9	10	10	11
	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88

DISTANCE IN FEET ROUND WALLS, INCLUDING WINDOWS, DOORS, ETC.

DISTANCE ROUND WALLS IN FEET	NUMBER OF ROLLS NEEDED
26	1
38	2
46	3
56	4
64	5
68	6
76	7
80	8

the ruins of their hopes and plans. Neither of them said a word. As they watched, the flames began to die down—there was nothing more to burn . . .

The kitchen door burst open and Dinah came running in, glowing with excitement

the river there it was no longer just a matter of whins on fire, but the house itself. Flames were licking and leaping high from the roof beams.

For a moment I stared almost in disbelief. Then, pitying that young couple, I made a dash for the road, crossed the bridge, and went sprinting along the track for Martbank. I could hear the crashing of slates, and the ugly, sucking roar of a fire that had taken ominous hold.

I got there to find others were ahead of me. Three local chaps had joined Joe. They had brought buckets, and were racing to the river and back, chucking the water at the blaze in a pitifully futile attempt to subdue it. They might as well have tried to put out a furnace with teaspoons. Somebody told me a phone message had been sent from down the dale to the fire brigade, but the place was obviously doomed.

I did what I could. Joe, black and sweaty, was toiling like a maniac. I wanted to say how sorry I was, and felt how useless the words would sound.

Somebody appeared, hurrying desperately along from the western end of the track. It was Dinah. Poor girl, she looked white and stricken. She ran up to Joe and touched his arm, and he just shook his head. There was another almighty crashing of those heavy slates. A sea of flame burst up, waxed fiercely, and began to die down. There was nothing more to burn.

Those two stood there, looking at what they had planned so eagerly to be their home. The three chaps who had helped kept awkwardly in the background. As for me, my one hope was that Joe had taken out an insurance directly he bought Martbank.

They went on standing there, very still, not speaking a word. I had to do something. I went across and offered my mumbled sympathy. I voiced the question I was so afraid of asking. I said: "Did you take out a fire policy?"

To my great relief, Dinah said: "Yes."

I patted her shoulder comfortingly. "'Tis a hard setback, my dear," I said. "But there's this: when things are settled, you'll be able to get it rebuilt better than you could have done yourselves."

She managed to coax up a slow, grateful smile. "You hear, Joe? It's true. It'll mean us waiting longer than we thought, maybe. But it'll be a good, sound house."

He let out a husky ghost of a laugh. "Ay," he said, and that was all. I got the impression he was still too dazed to find further words.

I went on with the encouragement. "In the long run, Dinah, you'll likely be glad. It would have been a mighty difficult job for the two of you. And you could easily have made a mess of things."

Like Joe, she let out a ghost of a laugh, very shaky, but somehow a good sign. The skin over her cheek-bones grew less taut.

I said: "Joe, how did it happen? A spark?"

"Ay, I reckon so. Before I knew owt about it, the place was blazin'—and me not two hundred yards away."

I SAID a few more sentences intended to be consoling, and went back home. On the way my mind insisted on grappling with a bewilderment that refused to stay quiet.

Though it was obvious that a spark must have started the fire, it seemed puzzling how the flames had taken toll with such devouring speed. Most houses in the south are fairly inflammable, but these buildings of ours, their walls at least two feet thick and of rough granite chunks, are much less vulnerable.

Downstairs, the floors of Martbank were big stone flags. There had been no furniture to kindle the blaze. I worked it out that the staircase must have been tindery, that in turn setting alight the boards of the upper floor. And the tall flames from these must have got at the roof beams.

Within a couple of days rumours began to spread through the dale. I heard them from farmers and shepherds and in the local. They were scarcely more than veiled hints, but what they hinted at set me wondering uneasily. I told myself it was just another case of our bush telegraph getting a wrong twist on something harmless.

I was wrong. Before the end of that week I met Dinah's father. He said: "Hes ta heard news?"

"What news?"

"About yon Lindridge and his fire." He scowled at the ground. "Ah told Dinah she should have chosen a local chap, instead o' someone we knew nowt about." He gave a sort of scoffing grunt. "He'll find himself in police court soon."

"What d'you mean?"

"Insurance company sent up some expert chap. Rummagin' about under fallen slates, what does he find but a battered two-gallon petrol can."

It was ugly news. I said: "Is this true?"

"Ay," he said bitterly, "true enough! What's more, he didn't stop at that."

HE went on to explain how the expert had carried out some technical test and proved that the can contained vaporizing oil.

"Phew!" I said. "Wilse Smith uses vaporizing oil in his tractor."

Preston nodded. "Mebbe Dinah'll see sense now. Nobbut a crook, that's what yon Lindridge is."

"Poor girl!"

He shrugged his shoulders. "'Twill teach her a lesson. She should never have gone a-courtin' with him."

I pitied Dinah. She would be near to getting her heart broken, and with no sympathy from her father.

As for Lindridge, though I held no brief for him, it was wretched to know that things had turned out like this. That afternoon I had met the two of them dawdling around Martbank. I had caught myself taking to him. The happiness in his eyes was a revelation.

I thought angrily: *The feckless fool, to court prison and bring misery to a fine lass like Dinah!* Had I met him at that moment, I could have knocked him down.

Affairs developed fast. The policeman, making inquiries as to the ownership of the can, was informed by Wilson Smith that it belonged to him and had been on the tractor in the barn at Hinninghow on the afternoon of the fire. Joe Lindridge was charged and arrested.

I shall always remember that evening. I was sitting in the kitchen, nailing new caulkers on my clogs, when somebody tapped at the side door. I called, "Come in," and Dinah appeared.

She had control of herself. The ancient dales breed of hers was too strong to let her break down. But the look in those wide eyes moved me to cry: "Lass—don't take it so hard!"

She said: "Will you help me?"

"That I will! But how?"

"Father'll do nothing. He says Joe's brought it on himself. It's not true! It's not true!"

I sighed. "I wish I could believe that. But all the evidence is against him."

Her mouth quivered. "You think he deliberately set fire to the place?"

"I can't help myself. It was a big temptation, and he risked it. And if you weren't in love with him, Dinah, you'd agree with my way of thinking."

She looked at me quietly and steadily. She said: "You've known me all my life. Have I ever been wild or feckless?"

"Nay, the opposite. But love does strange things to a lass. It can blind her judgment."

"Not mine. I'm the only one who really knows Joe. He's got his faults. We all have. But he'd never do anything mean and crooked. He swears he's innocent, and I believe him."

She paused and said again in a low, pleading voice: "Will you help me?"

"Ay, if I can."

"The solicitor says he'll apply for bail, and

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Passmore and his assistant, Tom Shaw, test strip lighting on a model theatre in their workshop

Magician by floodlight

Charles Passmore has a box of tricks to sell. Mannequins, and bats in a zoo, have appreciated its fluorescent colours

By JOHN HARMAN

A COLD October wind swept Battersea Park, London, on the night that Charles Passmore, a tough, burly electrician, waited under a lime tree with £1,200-worth of lamps and control gear. As a representative of Thorn Electrical Industries, he hoped to win an important contract for floodlighting the park's Festival Gardens.

He had been allocated the tree for demonstration purposes, and while he watched the contracts committee making its tour of inspection he could see that a dozen rivals, who were equally determined to get a share of the job, had mustered every type of conventional floodlighting.

As a touch of showmanship, he kept his tree in darkness until the committee arrived in front of it. Then, with dramatic effect, he began to switch on fifty-four tubular lamps, each 5 ft. long—and gave the world's first display of fluorescent colour changing.

The lamps, made of glass with inner coatings of glowing phosphor, took the tree through the seasons, beginning with a brilliant spring green. Blues, faded in, produced a deep summer green, and by fading out the greens and bringing in reds, he obtained the russets of autumn.

The committee was impressed. Hitherto, such close control of fluorescent light had been unknown. A great drawback with the lamps, which cost more to buy than tungsten bulbs but have five times the life and one-third of the current consumption, had been that they flickered out when the power supply varied: in fact, postwar power fluctuations had nearly killed the market for them.

Passmore's firm, however, had designed models with special coatings and control gear. They not only withstood voltage fluctuations, but could also be dimmed and brightened. "We got the lion's share of lighting trees at Battersea," he says. "The committee asked us to do thirty-nine, including twenty with colours which changed automatically every forty-five seconds."

Today, six years later, he runs a lighting service which he claims is unique. The scope for fluorescent lamps, which sell in Britain at a rate of 5,200,000 a year, compared with about 172,500,000 ordinary tungsten bulbs, has widened to bring him eighty contracts a month. Aged fifty, round-faced and quietly assertive, he has climbed ladders and crawled along high, narrow ledges to supervise installations in shops, cinemas, theatres, exhibition halls and fairgrounds.

One of his oddest assignments was filling a double-decker bus with rows of coloured lamps as a touring novelty for a civic event in Cardiff. "He wanted to make a really spectacular job of it and have an electrically driven waterfall running down the stairs," says Tom Shaw, his deputy. "But hills, and the camber on the road, ruled that out."

Passmore's dimmers have improved the visibility from railway signalboxes and airport control towers by enabling the light inside to be balanced with the changing light outside. Other requests have come from a dean, who wants to vary the lighting in his cathedral to suit the moods of the services, and from the owner of a zoo who is faced with the problem of putting bats on show because they sleep during the day. "The idea," he says, "is to shut the daylight from them and artificially move dawns and sunsets until they wake in the day and sleep at night."

Most of Passmore's work, though, has taken him outdoors. He has floodlit a castle, churches, hotels, town halls, garden parties and numerous fountains.

The latter type of contract has given him an intimate knowledge of park lakes throughout Britain. At Leamington Spa he was kneeling in a punt, trying to push under the water an aluminium reflector, which was part of his installation round a fountain, when he overbalanced and fell in head first. He discovered that the lake was well stocked with fish and had a deep lining of black mud.

"Half the battle in selling floodlighting is finding suitable sites," he says. "The owners can then be approached with definite schemes." His staff of fifteen, and the salesmen who sell the radios, TV sets and other goods made by his firm, report on buildings or natural features which might offer scope in this direction. Passmore himself has travelled from the Channel Islands to Scotland, finding that the farther north he went he got fewer contracts because the hours of summer darkness were shorter.

He maintains that if floodlighting is to be successful it must hit the eye. For this reason

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Trees and fountains show off fluorescent floodlighting at its best. When Passmore supervises installations, he often has to climb high, or risk a ducking in the water

Something really spectacular . . . ! It would mean promotion for Bob and a husband for Jenny. But nothing ever happened in the bundu

The Sergeant's Wooing

by WILSON MacARTHUR

As the little car negotiated the rough farm track cautiously, its headlights picked out the scattered *msasa* trees on each side. Jenny Grey snuggled deeper inside her wrap, in the drowsy contentment of the drive.

Beside her the hands on the wheel were lean and competent. Jenny, pleasurably tired after a happy evening, left it to them to get her safely home.

There was water in the deep wheel-ruts. As the car splashed through, Jenny roused herself and said: "It's been raining. Where are we, Bob?"

"Nearly home." Bob glanced at his watch. "Not bad—only just over an hour. I thought the others would overtake us easily."

Jenny said: "Uncle Barney will be glad."

"About the rain?"

"Yes. He needed it, to bring on the next batch of tobacco."

"He's got a lot of barns curing this season."

Jenny began to make up. She glanced at Bob and smiled. Even slumped in the driving seat he had something soldierly about him.

He said suddenly: "Uncle Barney's been out."

Jenny peered through the windscreen. There must have been a sharp storm; the dirt road was still dark from the wet and there were puddles in the pot-holes and wheel-ruts. The tracks of a car, larger and wider than their little runabout, were clear-cut in the fresh mud.

As the road curved Bob added, vaguely puzzled: "He's still out. Those tracks are coming this way."

Jenny smiled again. "Once a policeman, always a policeman—eh, Bob?"

He grinned. "You'll have to get used to it, my girl. But maybe it wasn't Uncle Barney after all."

They passed the big open shed that housed the farm's transport and saw that there were two empty bays.

"Vi isn't home yet," Bob said. "I thought she and Conway might have got ahead as we were leaving town, seeing they didn't overtake us on the road."

Jenny looked vaguely uneasy. "I wish she hadn't gone," she said. "Barney didn't want her to, especially after that row he had with Conway."

Bob pulled up at the veranda steps. "I didn't know there had been a row."

Jenny wished she hadn't spoken. After all, Vi was her aunt, if only by marriage, and Vi was also her hostess. If Vi chose to go to a ball in town with her husband's manager, that was her own affair.

"You know what Barney's like," Jenny said awkwardly. "He doesn't exactly mince his words."

Bob chuckled. "He certainly doesn't. Quite a character, your Uncle Barney."

"He's not really my uncle," Jenny reminded him. "But I'm very fond of him. You know, when my aunt died I never expected to hear any more from Barney. After all, we're only related by marriage, and who'd want to be bothered with a niece of his dead wife's?

"But Barney didn't see it that way. When he married Vi, I really did think that would be the end. But no, every time he came up to town he still took me out to lunch or dinner at one of the expensive places."

"Places where a sergeant in the British South Africa Police can't take his girl, you mean?"

"Places where a sergeant in the B.S.A.P. wouldn't be allowed to take his girl—so long as I'm the girl, my lad. I know you've refused to marry me, but I'm still interested in your bank balance."

Bob grinned at her, and then looked serious.

"I'm sorry, darling," he said, "but you know how it is. Lots of blokes would get married—let the wife work. Not me. My wife's going to stay at home and see that the cookboy doesn't poison me. I'm sick and tired of native cooking. And I want kids of my own. And until I get a commission——"

"Until. . . ." Jenny echoed the word bleakly. They'd had all this out before.

"Not many years now," Bob said stubbornly. "I'm sure I'm being lined up for promotion."

"When?" Jenny demanded, still bleakly.

"Two or three years' time. Even if we're well under establishment and they badly need more commissioned ranks, they're not going to promote Sergeant Robert Armour before the due date. Not unless he does something spectacular—and where would there be anything spectacular? Not out in the remote *bundu* hereabouts, anyway."

Jenny stifled a yawn. "I'm sleepy," she said. "Are you coming in?"

"It's after two o'clock. I'm on duty at seven. I'm going home, ma'am. Thanks for the buggy ride."

He put an arm round her shoulder and kissed her gently. When he released her he said: "I'm damned sorry, Jenny. But there it is."

She made a rueful grimace. "As you say, Bob. There it is. No commission, no marriage. Heigh-ho!"

She got out of the car. Bob followed, and a moment later a large brown dog launched itself on them with a whimpering cry. There was a brief mêlée and the ridgeback, who did not bark, quieted down, welcoming them.

Bob glanced towards a row of distant lights and became conscious of the throb of the generator in the power-house. During curing time the generator worked all night, for Tom Barnard—Barney—slept at the barns, taking turns with his manager Desmond Conway.

"Good night, sergeant," Jenny said.

Bob grinned, saluted and got back into the car and parked it. Then he wheeled out his heavy motor-cycle from the shed and kicked it quietly into life.

Jenny watched him go, heard the increasing volume of the deep-throated roar as Bob opened out well away from the house, and smiled approvingly at his consideration.

She had been in love with Bob Armour for a long time, and was not too disturbed by his strong convictions on the subject of working wives. But recently she had not been so sure she could over-rule his objections.

Secretly she agreed with Bob. She wanted a home and a family. But, since she could earn good money and time was passing and they were in love, it seemed such a waste. . . .

As she went indoors she heard a car in the distance, and presently powerful headlamps lit up the farmhouse.

A door slammed. She heard Vi's voice. It sounded cold as she said: "All right, Desmond. Put the car away. Don't make too much noise. Thanks for the evening. Good night."

Vi came indoors. She was tall, a beautiful woman still, a good twenty years younger than her husband. Her clothes were exquisite. She looked cool and wonderfully groomed and completely mistress of herself.

"Hallo, not in bed?" Vi gave Jenny a mechanical smile. "Did you enjoy your evening with your policeman?"

"Yes, thanks."

"He's nice. A nice type," Vi said. She added: "I'm going to bed. I'm tired."

Jenny watched her go. . . .

Bob Armour made a fast run back to the station. He'd only get a few hours' sleep and then he would be on duty again. But it had been worth it.

He woke at precisely five o'clock, with the police orderly's large hard hand shaking his shoulder.

"Sergeant! Sergeant, sir! *Nkos! Puma, puma!*"

Bob rolled over and sat up. "What the hell's wrong with you, Lokatela?" he demanded.

"*Nkos,* telephone!"

Bob swung out of bed, snatched up the phone. "Sergeant Armour here."

"Bob—oh, Bob!"

"Jenny!" Bob exclaimed. "What's wrong?"

"Uncle Barney. Bob—oh, please come. There's been a robbery. Barney's been hurt."

"I'll come at once. Doctor there?"

"He's coming. Please, darling. . . ."

Both European constables were in the room, one fully dressed, one bundling into his uniform. Bob snapped orders while he threw on his clothes. He yelled for a native constable. The motor-cycle leaped away and was doing sixty by the time it reached the main road, the police boy on the pillion clasping Bob's waist and clinging desperately. . . .

Jenny was waiting. In her pinched, white

ILLUSTRATED BY EDWIN PHILLIPS

Bob saw that all three seemed badly shaken. "Stay here!" he ordered them

face and red-rimmed eyes he read her distress. Vi was waiting, too—composed, yet, to Bob's sharp eyes, badly jolted.

Behind the two women was the thick-set burly figure of the manager, Desmond Conway, in pyjamas and dressing-gown, a cigarette burning down between two fingers. He, too, seemed badly shaken.

Conway came forward at sight of the uniformed figure. "Some damned native!" he said. "Poor old Barney! He might have been killed."

"How is he?" Bob asked swiftly.

"The doctor's with him," Jenny said. "He arrived just a few minutes ago. We did all we could. Barney's still unconscious."

"Right. Stay here! I'll go down myself."

Bob ran back out, got astride his motor-cycle and roared off to the distant barns. Barney slept in his office, a small building beside number one barn.

Bob went in. The doctor, glancing around, nodded. He said: "Hallo, Bob. He'll be all right. Lucky thing—the blow must have been softened by the pillow getting in the way.

"Hit with a knobkerry or something, I'd say. Caught him on the side of the head. He's out, but there's no serious damage. Bit of a shambles, eh?"

He was right. In a corner stood a large safe of an old-fashioned type. The key was in the door and the door stood wide open. Papers were strewn about. The huge old roll-top desk in another corner had been forced open, and several drawers had also been forced.

Bob wasted no time. The police vanette had arrived and he ordered a boy to stay in the room and allow nothing to be touched. The rest of the police boys went to work outside, their torches gleaming as they methodically combed the ground in search of spoor.

Bob rode back to the house. Vi half rose when he strode in. She asked quickly: "How is he?"

"Coming to, Mrs. Barnard. Doctor says he'll be all right. And now I'd better take some statements. Who got the alarm?"

"I did," Conway volunteered. He still looked shaken, but there was anger in his voice.

He had been awakened, he said, shortly before five o'clock by a sudden uproar from the barns and a boy rushing towards his cottage, yelling for him. The boy said his master was lying dead in bed, battered to death.

Conway rushed down to the barns. The boss boy was off ill, there was no one else who could be trusted, and without supervision the whole night shift had been sound asleep by ten o'clock, and heard nothing.

Later, one boy woke and got frightened when he realized how long he had been asleep. He went out but the office door was shut and there was no sound. Eventually he plucked up courage to look inside. . . .

Conway, seeing that Barney was unconscious but alive, locked the office door and ran to the house to telephone for the doctor. Then he wakened the household and they all went down to do what they could.

Bob wrote swiftly. He and the others sat in armchairs in a wide circle, well apart. Lep the ridgeback lay quietly beside Jenny, conscious of something wrong but not yet aware that his master was hurt.

After a while the kitchen door opened and the cook boy padded in with a tea tray. At sight of him, Lep stirred and his ruff began to rise. He gave a low rumbling growl as the servant passed close to him, and bared his fangs.

"He doesn't like natives," Jenny said mechanically.

"What dog does?"

Bob spoke without thinking but a second later Jenny, her gaze fixed on his face, caught a sudden glint in his eyes, a hardening of the jaw.

Bob glanced at his notes. "I reported to headquarters, of course," he said quietly. "Robbery with violence is serious, so the C.I.D. will probably be out. I can save them time if I get statements from all of you now; starting with your movements yesterday."

"Fire ahead!" Conway invited.

"Right! You drove Mrs. Barnard to town yesterday. At——?"

"Ten fifteen. Got there before eleven. Mrs. Barnard had shopping to do and I had to get the car serviced—she's just done her first five thousand miles. I took her straight to the garage and got her back a few minutes before five."

"And then?"

"Parked her near the hotel where Mrs. Barnard and I had arranged to change for the dance. After dinner we drove to the dance, and after the dance we drove home."

"When did you get to the dance?"

"About five minutes before you."

"You didn't leave the building during the evening?"

"Look here, Sergeant!" Conway said angrily. Then he calmed down. "All right. No, I didn't. No reason to. There was the buffet, remember?"

"All right. What was in the safe?"

"No idea. I haven't got a key. I was in town earlier in the week and cashed a cheque for Barney——"

"For how much?"

"Four hundred."

"That's a lot, isn't it?"

"It's the end of the month. There's the boys' wages, and we've got nearly sixty women reaping and tying just now."

"Any record of the numbers of the notes?"

"Not that I know of. Barney opened the safe and I bunged the lot in."

"What else was in the safe, Mrs. Barnard? Got any idea?"

Vi's face was white and drawn, and her voice was hoarse as she said: "All my jewellery—or nearly all of it."

"You have a list?"

"It's insured. Barney has a list."

Bob went into the dining-room where the phone was. He spoke briefly to headquarters and came back.

"Will you do something for me, Jenny?" he said. "I want you to sit in there and wait for a message. The chap at the other end knows about you. Write it down and come and find me. I'll be around."

Jenny was glad to sit down. The minutes dragged. When the phone rang twenty minutes later, it startled her.

"Miss Grey? Message for Sergeant Armour. The number is 5076. Got that?"

Jenny repeated it, wrote it down carefully on a pad and hung up. She went out to find Bob. He was coming from the transport shed, where her little car and Vi's big Buick filled the last two bays. She hurried to give him the note, but she could ask no questions, for lights flared and two cars drove up. The C.I.D. had arrived.

An inspector emerged from the leading car. "Well, Armour?" he said.

Bob gave him a brief account of events. "It looks like a native crime, sir," he added. "It's got all the hallmarks. The manager, Desmond Conway, dismissed one of the boys yesterday—kicked him off the farm right away. He's a known bad lot and was in trouble several times in town."

"You've started a search?"

"Yes, sir. The police boys haven't found any spoor. Whoever did the job must have simply walked away quietly along the cinder path, instead of taking to the veld."

"Much taken?" He whistled when Bob told him. "All right. Anything else?"

Bob hesitated only a moment, his face suddenly grim.

"It looks like a native crime, sir. But can you see any native, even a hardened criminal from town, bashing Mr. Barnard on the head, rifling the safe and walking away along the cinder path? He'd take to the veld, from sheer instinct."

The inspector watched Bob keenly, but made no comment.

"There was a heavy rainstorm some time between ten and eleven last night," Bob went on, "and a car left the farm after it. I spotted the tracks when I was driving Miss Grey home after the dance in town. You saw my constable guarding the road."

"Anything else?"

"The ridgeback, Lep—he doesn't like natives. He never lets one near without growling. But he never growls at Europeans."

The inspector's face had grown grave. He said:: "You're suggesting it wasn't a native crime?"

"Only a European could have got into the office and persuaded Lep to leave it while his master was asleep there."

There was a stir on the veranda. Conway appeared and came striding over. In the early dawn his face looked grey and peaked. "Well?" he demanded. "What are you fellows doing about it?"

The inspector gave Bob a swift glance. Uniformed figures were closing in on the group.

"You'd better ask the sergeant," he said.

Bob faced the manager squarely. He said: "You drove the Buick direct from the garage to a car park and didn't use it again except to drive to the dance and then home. That right, Mr. Conway?"

"I—yes, that's right. But I don't see why you're wasting time——"

"I phoned headquarters and asked them to check with the manager of the garage. When you handed the Buick in, her meter registered 5076 miles. It's forty-nine and a half miles from the dance hall to the farm, by Miss Grey's speedo. The number on the Buick's clock is now 5225. That makes a hundred and forty-nine miles. And there were fresh tracks on the farm road after the rain last night."

Bob's European constable came roaring up on his motor-cycle. His face showed youthful excitement. "The tracks on the road are identical with the Buick, sir," he reported.

Bob, staring levelly at Conway, waited for his reaction. The manager's face had gone greyer still, and his eyes were murderous. But he said nothing.

"The streets in town are quiet between ten and eleven at night," Bob went on. "The main road's empty until the cinemas come out. The Buick could have got here and back in less than a couple of hours without being spotted."

"If you're suggesting I drove her," Conway began, then bit his lip. "You must be mad, Armour. You saw me often enough last night——"

"You went into the buffet at ten o'clock when it opened. Mrs. Barnard stayed talking with friends. You weren't in the buffet when Miss Grey and I went there at half past ten. We didn't see you again until nearly midnight."

Conway began to bluster. "Look here, Armour!" he exclaimed. "I don't know what you're getting at, but I'm hanged if I'll stand any more of this. I——"

He stopped, suddenly wary, taking in the tight ring of figures round him.

"You forgot Lep," Bob finished, simply.

There was a long tense moment. The inspector stepped forward. "I'll have to ask you to come with us, Mr. Conway," he said grimly. . . .

As the inspector led Conway indoors, the sun rose. Bob went to work. The police boys scattered, searching. An hour later they found the loot where Conway had hidden it.

By that time the inspector had pieced the picture together: Conway had been infatuated with his employer's wife, an expensive infatuation that saw him deeply into debt. He laid desperate plans, seizing the chance when there was real money in the safe. He had dismissed the unfortunate native with the bad record, so that suspicion would inevitably fall on him.

But he'd forgotten Lep. . . .

"One thing, Armour," the inspector said later. "What put you on to the fact that it wasn't a native crime?"

"The ridgeback, sir," Bob replied. "He growled when the cook boy came in with a tea tray."

Barney was tough. In a week he was on his feet again and was busy advertising for a new manager. As for Vi, the shock, Jenny decided, had done her the world of good.

"Chuck the police, Bob," Barney urged. "Come and be my manager."

But Bob, after some heart-searching, smiled and shook his head.

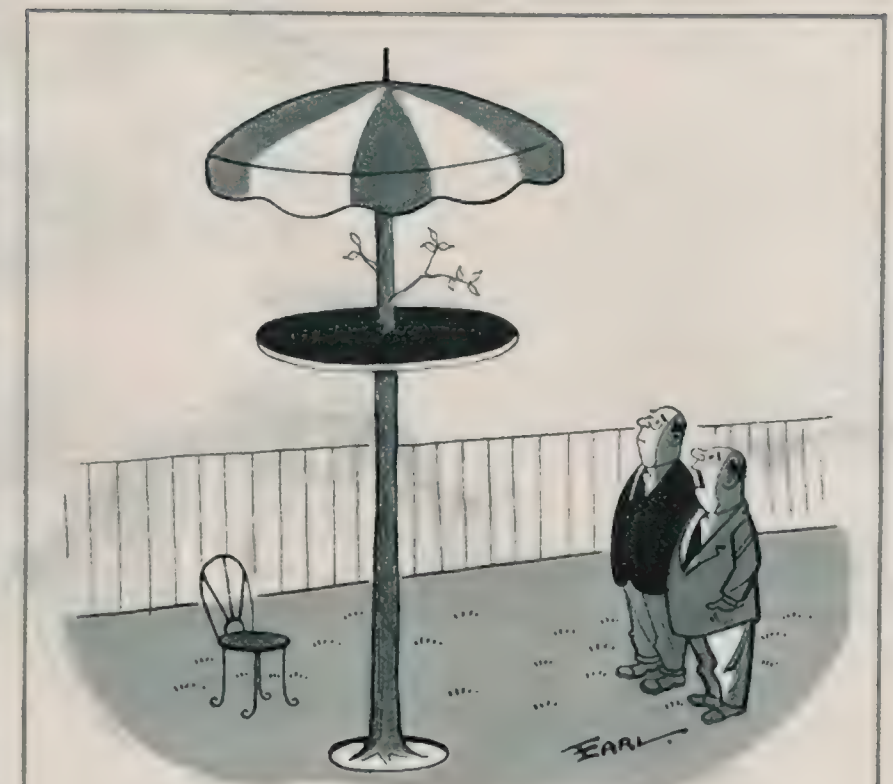
"You're a maddening person, darling," Jenny told him. "We could have got married this year."

"We can still get married," Bob said. "Provided you learn to show proper respect to a commissioned officer of the B.S.A.P."

"Bob! You mean——?"

"They just couldn't wait to promote me, child. That's what observation does for you."

THE END



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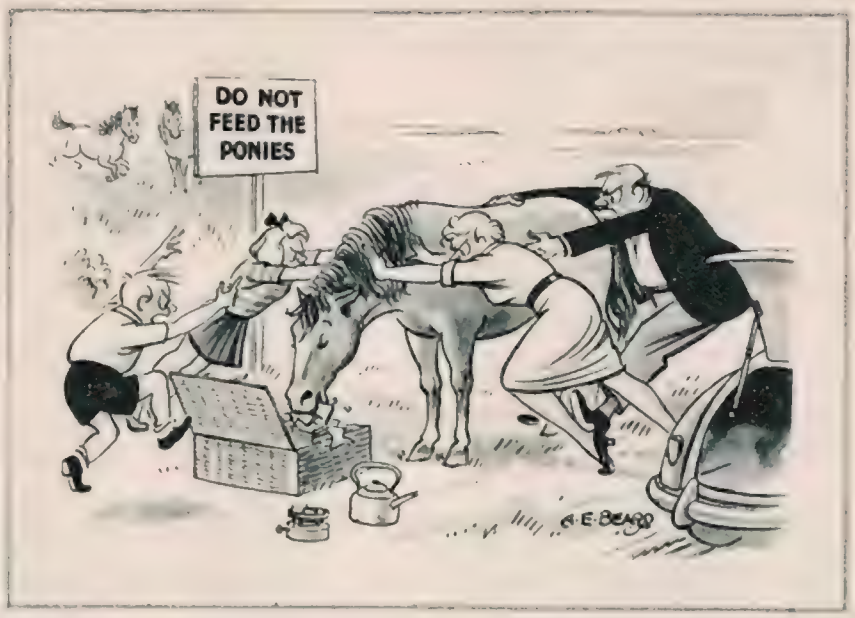

Magician by floodlight

continued from page 35

an attempt to illuminate Brighton's Palace Pier from sea level was a failure. The lamps, mounted on small rafts, seemed lost in the choppy sea, and the experiment ended with two assistants being trapped under the pier by a rising tide. They had to wait for it to go down before they could get out.

Trial and error have shown that the way to bring out the sparkle in cascades and fountains is to put the lamps close to the running water. "Plain, modern buildings are easier to floodlight than those in styles like Gothic, which cast awkward shadows," says Tony Scales, one of the firm's executives. "The technique of illuminating trees in a park is to do them in groups, so that they stand apart from the rest."

Since the result of lighting depends on the amount of reflection, Christmas trees always test Passmore's skill. Their matt surfaces tend to absorb light.

An unusual technical snag occurred at Bexhill, Sussex, where he had illuminated some islands in a boating pool. The client complained that the lamps could not be switched on. Passmore, who regularly has to squeeze himself into children's boats, rowed out to inspect the installation, but could see nothing wrong. "It turned out that a chemical had been added to the water to destroy algae. The solution had got splashed over the lamps and had affected the wiring."

The wide variety of contracts makes it necessary for each installation to be tailor-made. Passmore and his assistants design and assemble the circuits in a workshop near St. Pancras Station. They mainly use fittings which contain three lamps, the choice of colours—gold, pink, green or blue—depending on the blends of colour needed.

Most clients insist on seeing floodlighting before placing orders, so Passmore spends much of his time arranging and giving demonstrations. The task is sometimes complicated by bad weather.

At Glasgow he laid out £600-worth of lamps to light the front of a cinema, and when he returned the next morning to dismantle them they were hidden under a blanket of snow. Unable to remember exactly where they were, he wondered how to avoid treading on them—until he thought of switching on the current. The heat melted the snow in an hour.

When organizing a demonstration he tries to make it an occasion by inviting local dignitaries. He gives a talk on floodlighting, followed by a tour of the site. One corporation was sufficiently pleased with his £350 installation round a fountain to buy the equipment outright, but many clients prefer to hire the lamps. The charge for a scheme such as lighting a waterfall or a large tree is about £20 a week, plus the cost of sending an engineer to supervise the final fixing.

Passmore asks theatre and cinema authorities to his demonstrations in the hope of interesting them in fluorescent lamps. The innovation of this lighting for stage use has aroused a keen controversy. Traditionalists in show business dismiss it as lacking the punch of tungsten lighting, while enthusiasts such as Passmore, who admit that it is unsuitable for spotlights, say that for battens and footlights it offers a worthwhile saving in costs.

A user who regarded the lamps with disfavour was a music hall actor. He pointed out that the absence of glare gave him a clear view of the auditorium. "In the half-empty houses which *my* turn attracts, that's no encouragement," he said.

So far, Passmore has equipped about thirty theatre, cinema and concert hall stages, in addition to supplying lamps for special effects in the Royal Opera House and other theatres.

HE lives with his wife and seventeen-year-old son at Whetstone, north London, where he was born. He intended to be a marine engineer, but a prospective job at Jarrow fell through on account of the depression in the late twenties, and he became an eleven shillings-a-week apprentice to an electrical firm at Chelmsford, Essex.

In 1931, during the hey-day of cinévariety, he joined a famous theatre circuit as an electrician. He swept up eggs which the audience had thrown at the screen, and looked after circus animals. At the end of one evening's performance, when the last reels of a film were being shown, he found himself alone backstage trying, unsuccessfully, to quieten a sea-lion which was suffering from hiccups.

He went to his present firm, which is reputed to have the biggest output of fluorescent lamps in Europe, in 1950. One of Passmore's ambitions is to persuade British stately homes to attract tourists by means of festivals of floodlighting, complete with music, as is done on the Continent.

His theatre training still comes in useful. When lighting fashion parades—he lit Norman Hartnell's Coronation collection in Edinburgh—he flatters the mannequins with a combination of green, blue and red lamps which produces the soft white light demanded by leading ladies.

A further trick is to switch on green lights for the entrance of a model wearing red, or red lights if the model is in green. Until she steps into ordinary light, the audience believes that she is wearing black.

Even Passmore was surprised by a stunt which he did at a recent dance. He put the room in darkness and turned on an ultra-violet lamp, the intention being to make clothes washed in detergents, which contain a fluorescent substance, glow in a ghostly white.

"Apparently, some laundries use a marking ink which is only visible under ultra-violet," he says. "The men, who had taken off their jackets, were suddenly seen to have code numbers scrawled across the backs of their shirts."

THE END

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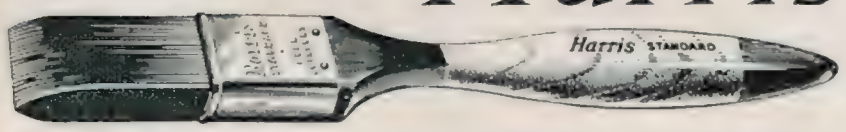

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Flare-up at Martbank

Continued from page 34

they're bound to grant it—if somebody will stand for him."

She waited. I had an urge to point out there was no sense in standing surety for him, considering I was convinced of his guilt. But her eyes were too much for me.

"All right," I said. "I'll do it."

They granted bail. Two hundred pounds was the sum, and I accepted the liability.

The case was put down for trial at Carlisle. I came out of the court with Joe and Dinah and took them back to Iredale in my car. He sat huddled and dumb at the back, and she held his hand.

When we reached the mouth of the dale, the rain that had been falling began to abate. The cloud over the higher fells crumbled apart like threadbare curtains, and in no time it had fairied up with the miraculous swiftness of our parts.

Dinah smiled forlornly at the damp crags and grasses gleaming under the sunshine. She said: "If things could clear up like that for us. . . ."

I STOPPED the car by a little hump-backed bridge, turned my head, and looked Joe straight in the face. I said: "You've got a lass in a thousand. If you've been lying to her——"

He said sombrely: "I've not. I swear I had no part in that fire."

"Then how did that petrol can get to the spot? Somebody must have put it there. It was in Wilse Smith's barn on the Sunday. Are you suggesting he did it himself?"

"Nay." His chest heaved. "Things are black against me. I know it. But for Dinah here, I'd want to——"

"Hush!" she said gently, and patted his hand.

I dropped them near Hinninghow. Wilse Smith had agreed to keep Joe on pending the trial. A just man, Wilse, though without sentiment. He said to me: "I'll not penalise him till he's been found guilty. Lambin' time's close, an' he's a good shepherd—an' a grand worker, too."

Smoking a pipe that night before bed, and turning things over in my mind, I could find scant hope for that unhappy pair. Even if by some miracle they found Joe not guilty, it was something that would stick.

Our dalesfolk are no saints. For instance, they think none the worse of a chap for a bit of poaching. But this was different. Life here would be uneasy for Joe and Dinah. They would be up against guarded whispers and significant glances.

Why in the world had a lass like that to be caught up in such trouble?

As the question shaped itself, the kitchen door burst open. Dinah came actually running up to me. She exclaimed: "Listen! Listen! Why ever didn't it strike me before?"

I pulled up a chair, made her sit down.

"Steady, now," I said. "What's all this?"

She said: "That remark of yours started me off, that remark about somebody must have put it there. I couldn't get it out of my brain. Of course somebody put it there. But not Joe."

"Nay, lass, there can't be anybody else."

"There can. Somebody who had a grudge against him. Somebody who went to Martbank and deliberately set it on fire, while he was burning those whins."

It took some swallowing. "That's over-fanciful, Dinah."

She ignored that. She said: "I've just come from seeing Joe. I had to find out if there was anyone in the dale who bore him a grudge. Oh, why didn't it occur to me before? I'd heard something about it, and treated it as pathetic and silly, but——"

"What are you talking about?"

She leaned forward. "When Joe was first here and joined the Young Farmers' Club, he used to walk back from the meetings with Nan Creech. There was nothing in it . . . nothing at all. But you know what Nan Creech is like."

Indeed I did. Nan, like her parents, was a strange, brooding creature. The family had a reputation for vile bad temper. They mixed with few of their neighbours and presented a surly exterior to the world.

It was rumoured that the father had injured a man in a brawl many years ago and had been lucky to escape imprisonment. His wife and daughter lived in fear of him, and most of us picked our words carefully on the rare occasions when we found ourselves in his company.

Nan was an intense, obsessed girl, notorious locally for developing "hates" against people and nursing her feuds for years. But most of us pitied her because her father led her a dog's life.

Dinah went on, "Joe had to stop walking back with her. She got the idea he was courting her. When he told her, kindly enough, that he wasn't, she created a terrible scene."

I could picture it. If Nan got the idea a man had jilted her, she would brood on her supposed injury until malice overrode every good instinct she possessed.

I said slowly: "Ay, that could have turned her ugly. But are you trying to persuade me that she's got the cunning to scheme a situation like this? Set fire to Martbank so that he would get blamed for it? She may be capable of anything when her temper snaps, but she'd never be capable of anything as coldly calculating as that."

"No," said Dinah, "I don't think she had any idea like that in her head. But suppose she saw him in the distance that Sunday, burning those whins? It might have occurred to her to get her own back by setting Martbank alight.

"She could have argued that people would think the burning whins had started it, so that nobody would dream of suspecting her. Anyway, she was probably too worked up at the time to care whether they did or not."

"Um!" That grunt of mine was deliberately dubious. Privately, I began to get the idea that she might have hit on the truth. But the prospect of proving it seemed so impossible that I thought it better not to be too encouraging.

"The dale's deserted on a Sunday afternoon in March," Dinah insisted. "She could have picked up that can of vaporizing oil at Hinninghow without any likelihood of being seen. If she kept to the river track, she would have been out of sight of Joe."

"That's a maybe, my dear. It's feasible. But how are you going to prove it?"

"I've thought that one out, too. I want your help again."

I smiled into her excited young eyes. "I'm more than ready. What do I do?"

"Ask her here, say—Thursday evening. Six o'clock. Tell her there's somebody you want her to meet. Don't mention my name or she might be suspicious and take fright. And leave the rest to me."

"You think she'll come?" I asked sceptically.

"I think so. She's vented her spleen. Now, if I'm any judge, she's experiencing some very uncomfortable remorse."

I patted her shoulder. "Very well. I can't figure out how you'll make her talk. Her kind can be stubborn oysters. But I'll do as you say and I'll pray you prove right."

I felt awkward when I gave the invitation to Nan Creech. She glared at me and said: "Who wants to see me? Why? You're all against us, aren't you?"

"You wouldn't have a guilty conscience would you, by any chance?" I retorted.

I regretted that instantly because it must have aroused her suspicions to an even greater pitch. But it had one helpful effect. She began to look frightened.

"I'm not going to meet any friend of yours," she said sullenly.

"Please yourself!" I said and turned away.

I knew then that curiosity and fear would make her keep that rendezvous.

Promptly at six she arrived on the Thursday, walking defiantly into the kitchen. I offered her a chair and she sat down on the edge of it, hostile, uneasy. She looked round warily and said: "Where is this friend of yours and what does he want? I can't hang around here all evening."

Dinah came in through the other door. Nan looked startled, and I had the intuitive feeling that it was Joe she had expected to confront her.

"Where were you on the Sunday afternoon that Martbank caught alight?" Dinah asked.

The directness of the attack shook Nan. She half started from her chair and her face went very red.

"What do you mean?" She almost shouted it.

Dinah said: "If you won't give the answer, I will. You were at Martbank."

"That's a lie!" Nan rasped. "You come and repeat that in front of my father. He'll show you——"

"You really want me to do that?" I'd never guessed Dinah's voice could be so sharp. "All right! Come on!"

She made to move, then smiled as Nan stayed firmly in her chair. "You didn't mean that, did you? That's one of the things you're afraid of. What your father would do to you if he knew you'd committed arson."

"It's a lie." Nan repeated passionately.

"Suppose I produce a witness who saw you walking along to Martbank with a can of vaporizing oil? What are you going to say to that?"

I knew then that the bluff had worked. Fear and guilt were written all over Nan's face.

Dinah said more gently: "You think we're all against you in this district, don't you?"

"Well, so you are. You hate me because of my father. None of you has ever shown me a scrap of kindness."

"Joe has, I think," Dinah countered. "He threatened your father once, didn't he? He warned him not to bully you any more."

"How do you know that?"

"Oh, from one or two things that Joe let slip—and by putting two and two together. Joe's been very kind to you. But because he couldn't feel for you what you fancied you felt for him, you had to repay him by ruining his life.

"At least, you will have ruined it if you don't speak the truth. I won't be able to have him, you won't be able to have him, nobody will. He'll go to prison—for something he hasn't done."

NAN looked haggard and the fight had gone out of her. "What can I do?" she demanded wildly. She was near to tears. "If I tell them, they'll send me to prison. Besides, there's my father. He'd kill me with that temper of his if he knew what I'd done."

She was so pitiful that Dinah slid her arm around her shoulders.

"Listen to me, Nan," she said. "We're going to see a solicitor now, a friend of my father's. He'll look after you and tell you what you must do.

"When your case comes up, he'll see that the magistrates know all the facts, including the kind of life you've lived under your father's roof. The solicitor says that they'll say you're in need of care and protection, not prison. Now—will you come with me? Will you trust me?"

Nan sat there stiffly for a while longer. Then she gave a quick little nod, and buried her face in her hands.

An hour later, after leaving Nan at the solicitor's house, I was driving Dinah up to Hinninghow. Though the westering sun lay behind us, by the shine in her eyes it might have been setting to the east.

Joe, the milking over and the odd jobs finished for the day, was standing in the stackyard with his elbows on the gate that opened into the home field. He was staring seawards, down the length of the dale, where shadowed fields faded softly in the twilight and the tops of the lower fells still held the lingering burnish of the west. But by the look of him, all he saw was the bleakness of his own thoughts.

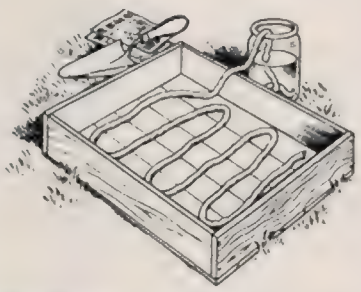
His head jerked around at the sound of us. Dinah leaped out and ran across, her arms held wide.

"Joe! Joe! Oh, it's wonderful!"

I left her to tell him. There are times when two's a great deal more marvellous than just company. THE END

Your garden and mine

by PERCY THROWER



BEFORE putting compost into seed boxes I run a length of wool, zigzag fashion, across each box and into a jar of water. The wool absorbs the water gradually, and keeps the compost moist. *I. Howes, Sutton, Surrey.*

When singling root crops such as parsnips and carrots I cut off the unwanted seedlings at ground level with small scissors, leaving the seedlings required. This ensures that the roots of the future crop are not disturbed, and avoids forked roots.—*W. Lawrence, Bellingham, Northumberland.*

PERCY THROWER says: When sowing seeds in pots or boxes it is important not to give them too much or too little water. Seed soil is very porous and on a warm day dries rapidly. This, followed by watering, can be harmful. The wool-and-water plan will maintain even moisture, and is valuable to those away at business all day.

The amateur often finds it difficult to thin seedlings without disturbing those which are to remain. If scissor cut is made below the lowest leaves, the seedlings are not likely to grow again.

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WORK—2

By working faithfully eight hours a day, you may eventually get to be a boss and work twelve hours a day.

Robert Frost

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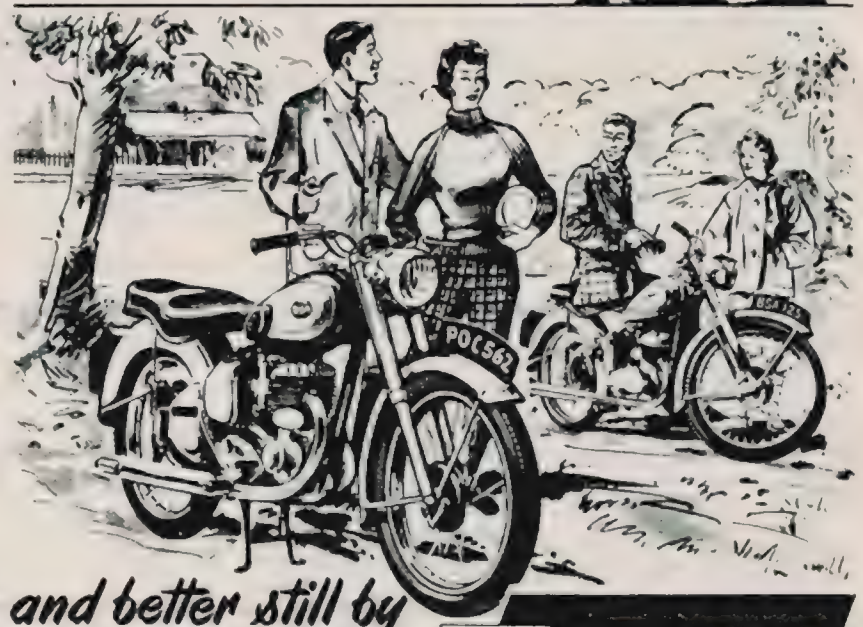

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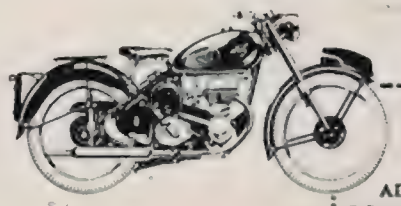

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The proving flight

Continued from page 17

night-stopping in Iceland, might be disastrous. The press might take the wrong slant. People might get the wrong idea. Before she had a chance to prove herself, the Emperor might get a bad name."

Cavendish fingered his moustache. "Now from the master of the aircraft's point of view—" he began.

But Sir James was too quick for him. "Now tonight . . . we managed to land. Therefore the visibility is adequate for the actual operation of take-off. Am I right?"

Cavendish frowned. "Just. But——"

"From what Bellamy said, I gathered that the forecast weather on the other side is better than here."

"That wouldn't be difficult, Sir James."

"But we landed. And, forecasters being what they are, the American weather might be perfectly all right."

"Company regulations——"

"But this is no ordinary *commercial* flight. Look at the Emperor's range . . . her power! And what a trouble-free performance she's given us from London."

"She's certainly kept remarkably serviceable."

"Smooth! Smooth!" Sir James paused, as though now he was positively encouraging Cavendish's collaboration. "And there's the temperature at Montreal you mentioned."

"Yes . . . interesting, that. A possibility perhaps, of a fog clearance earlier than anticipated, provided that——"

"Quite! And remember, you're known all over England, Captain Cavendish. Your reputation is bound up in the success of the Emperor. How long have you been flying now?"

"Thirty years."

"Thirty years! Very nearly right from the start of civil aviation! You've done all the pioneering. Taken all the chances that have made civil aviation advance in the phenomenal way it has done. And it is still advancing."

DRAMATICALLY, the chairman came to a dead stop. "And why?" he added. "Because men like you are still out there in front . . . leading us on."

A far away look came into Cavendish's eyes. He said, almost to himself: "It's been a long time."

"Twice as long as Captain Bellamy! Not that I'm going to say anything against him. He's a young man, not settled down yet.

"But you and I are of the same generation. We know where our duty lies. And I want *you* to take over now. In a difficult situation like this, something more than piloting is wanted."

Sir James raised his head, and his eyes glittered with a burning respect. "Leadership! The pioneering spirit! You, Captain Cavendish!"

The pilot suddenly stood up. "They will have refuelled her by now," he said. "We have lost enough time on this flight . . . *already*."

They left Room 24 in high good humour. Then half-way down the stairs, the lights went out.

Sir James made a joke about fuses. With difficulty, in the darkness, they located their own kind. Then the lights came on again.

Cavendish was just saying that the Emperor would be taking off immediately, under his command, when Murdoch came up to interrupt him. The short spell of darkness had not been fuses. A tractor engaged in towing snow-ploughs over the runways had inadvertently taken them over the main power cable, cutting it to shreds.

"But the lights have come on again," Sir James expostulated.

"The domestic supply and the telephones have an emergency system, sir, but there's no emergency system for the field."

The chairman said: "You mean . . . there are no runway lights now?"

"None, sir. Not until the cable's repaired."

"And when will that be?"

"Tomorrow some time, sir. With all the snow, it'll be difficult. I'm

afraid it rules out take-off until after the sun comes up."

The chairman seemed to change colour. Then, as though with a supreme effort, his face reverted to its accustomed calm.

Sir James had fought nearly everyone there was to fight in the British aviation industry. With his employees, he had inspired a few and driven the others. Through all that avalanche, he had won through. But now, after this single, arrant piece of carelessness committed by an unknown oaf, there was only one thing in heaven and earth that was left in *anyone's* philosophy.

And that was to go to bed. . . .

Sir James and Brocklehurst departed, with Captain Cavendish. Left without a centre, the human circle from the Emperor for the moment looked lost

WORK—3

Work is work if you're paid to do it, and it's pleasure if you pay to be allowed to do it.

Finley Peter Dunne

until Bellamy began making arrangements for their lodging.

"Looks like the barn for us tonight," he said.

Then he turned to the stewardesses. "But you two might as well go to bed properly in the aircraft bunks."

"Yes, sir," Lalette said for both of them, and they started to squeeze their way through to the door.

Bellamy called after them. "Don't use the lights! The batteries are low . . . and I don't want you messing around the cockpit looking for the master switch. You've got torches?"

They nodded and moved on towards the door. Then, huddling their shoulders up and shielding their faces, they dashed through the snow across the ramp and up the stairs by the Emperor's flanks.

Inside, Angela shivered. "Cold!" she said.

"Absolutely petrifying!" Lalette rubbed her hands together and looked around the cabin. "What wouldn't I give for a cuppa! If the Big White Chief hadn't said no lights, we could make quite a cosy brew. Anyway I'm going to forage."

She came back, swinging her torch gaily, and tossed a packet of biscuits into Angela's hands. Then she curled herself into one of the seats and said: "You know, it's really rather fun, after all. It's a lovely sight if you look out of the galley window. You can see all the aircraft and the snow and the lights in the hangar. It's quite a picture."

Angela had slid reluctantly into one of the seats. "I don't think it's fun," she said flatly. "None of it has been. And now this cold!" She clenched her fists and banged them together. "I never could stand cold. Never!"

Lalette said gently: "If you got ready for bed, you'd feel better."

"I can't. I'm too cold to *move*."

"Well, put a couple of these around you." Lalette pulled down one of the bunks and tossed two blankets to her.

"And all the fuss there's been all day. That *awful* send-off! Having Sir James on board! Everyone *knew* something would go wrong. And then that awful landing! Five attempts! Worst I've ever been in." She looked across at Lalette. "And other people were frightened too. I *know* they were."

Lalette shrugged her shoulders. "Well . . . we're here now. That's all that matters." She unfastened her tie and unbuttoned her blouse. "You know," she said, eyeing Angela warily, "the longer you sit there, the worse it'll get. The cold, I mean."

Angela whirled round suddenly. "Leave me alone."

Lalette looked away, pretending to be absorbed in the unzipping of her skirt. Then she heard a snuffle from Angela. She saw tears rolling down her cheeks.

Nervously, Lalette edged nearer. Gently, she put an arm round Angela's shoulder. Then she drew her closer.

Quiet minutes went by. Gradually Angela stopped sobbing. She gave her face a final scrub with her ball of a handkerchief. "I'm sorry," she murmured. "I don't know what you must think of me."

"That's all right." Lalette stood up and stretched, her voice quite shaky with relief. "It's this damned cold." She peered at Angela's face in the torchlight. "You look pretty blue." She pursed her lips. "You know what? I'm going to boil a kettle. A hot drink and a hot bottle. Absolute bliss! And absolutely essential!" She fished inside her bag and brought out a pair of highly unpractical satin mules, and then, stockinged heels smacking against the quilted soles, she moved gracefully towards the galley.

She was back almost at once. "I forgot," she said, "about the master switch. Now where would it be?" She tapped her teeth with a fingernail. Then she said: "Well, it's bound to be up at the front——"

Angela looked distressed again. "But ought we to? I mean, Captain Bellamy did say——"

Lalette said quickly, "Well there's no harm in *looking*. It's not sacred up there." She started to move towards the door. "Come on," she called over her shoulder. "Stretch your legs. Come and make sure I don't pull up the undercarriage or something."

Lalette scanned the front instrument panel, and then turned and looked at the engineer's. "Now let me see . . . ah, there it is, I betcha!" She flipped on a switch with a for-a-sheep-as-a-lamb air. "I'll wait here if you'll try the kettle and the hot-plate. Will you? Oh, and try the cabin lights as you go by."

THROUGH the half-open door, she saw the long cabin suddenly illuminate. Then Angela put her head round the doorway to the galley, and called: "Everything's working. Hot-plate, kettle and lights."

"Praise be!" Lalette waltzed herself skilfully round and round up the aisle and into the galley. "Look," she said, giving Angela a gentle push, "leave all this to me. You choose your bunk. The ones at the back haven't been used yet. And I'll make you a drink."

She hummed to herself while she boiled water, filled two hot bottles and put them in the bunks, and made the hot drinks. Five minutes later she put her head round the door. "Get into bed, I've put your hot-water bottle in. The drink's just coming up."

She came slowly up to the bunk, carrying one of the company's cream plastic trays. "If you wanted tea, I'm sorry, but you're going to be disappointed. I thought it would keep you awake, so it's hot milk instead. And there's a couple of aspirins, just to make sure."

Angela drained the beaker, and handed it back to Lalette. "You make a good nurse," she said, "and I feel much better." She huddled herself under the blankets. "But tell me," she added anxiously, as Lalette turned away. "Weren't you nervous yourself? I mean, just a bit?"

"Oh, I was terribly nervous at the time. But I knew Bellamy would get us down. If it was possible. And if it wasn't . . . well . . . there wasn't much any of us could do about it."

"But in here . . . in the cold, thinking about it . . . I was *awful*, I'm afraid."

A ghost of a smile plucked at the corners of Lalette's mouth but was immediately laid low.

"Oh, different things make different people feel miserable. It's the cold that gets you . . . now with me——"

"Oh," Angela said, a shade disapprovingly. "I really can't imagine anything getting *you* down. You're not the kind."

"Well . . . let's hope you're right." Lalette closed the curtains of Angela's bunk. "I don't suppose it'll be a long night, but sleep well."

She crossed to her own bunk, undressed, and scrambled into bed. . . .

The others had gone to the barn. This was a disused hangar, separated by wooden partitions into cubicles containing six or eight bunks. When things got desperate, it served as an overflow dormitory.

The crew knew the place of old, but it was worse than they remembered. The emergency supply did not provide electricity for it, and the place was already full of stranded men of a number of nationalities. A couple of noisy poker games were going on by candlelight.

They went from cubicle to cubicle, peering into the darkness to try to

Wise men say

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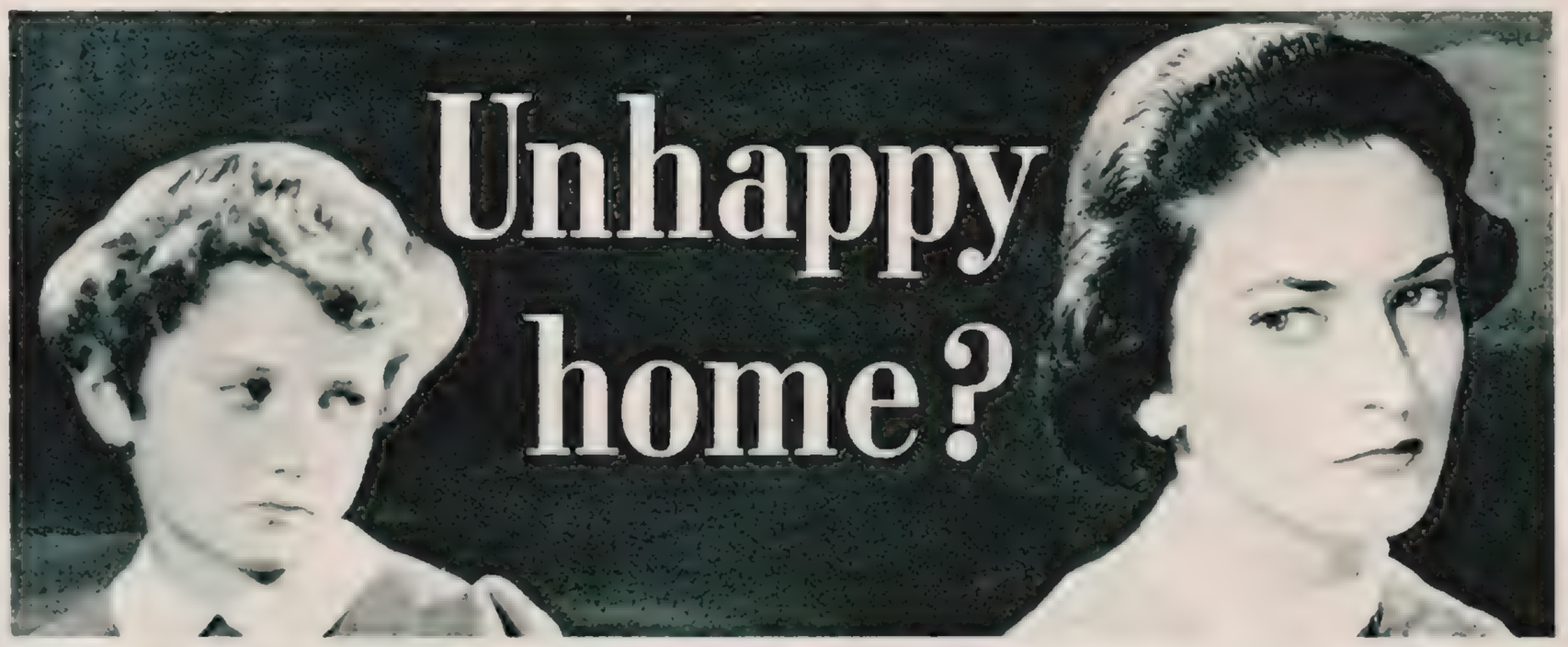
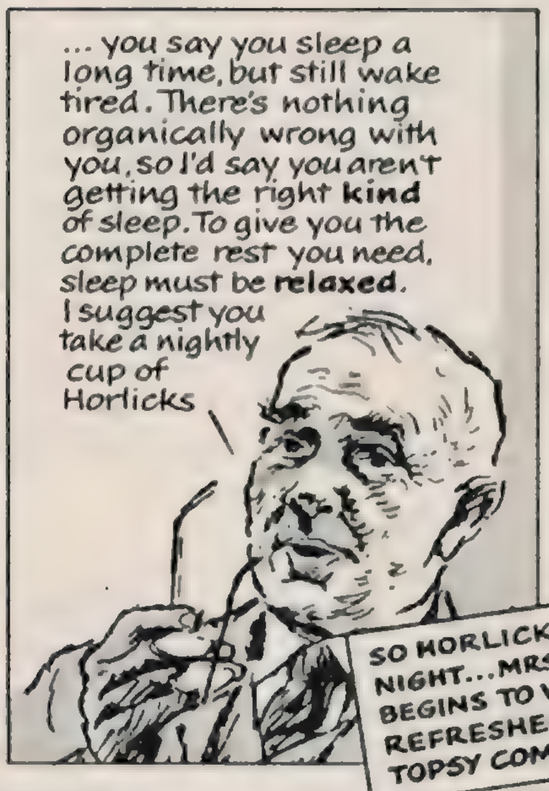


THAT EVENING
Topsy was my cat and I want her! Mummy's been beastly—
S-sh, darling! Mummy's very tired these days—she's going to see the doctor tomorrow

...that's why John told me to come and see you, Doctor. It's all because I'm so tired these days'... it makes me bad with Janet... dead tired all the time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locate unused beds. Hooper and Rawlings found two, one above the other, over on the far side, away from the door. Fully clothed, they clambered in and lay down.

For a number of minutes, they listened to the snores and the talking, while outside the wind howled. Then Rawlings suddenly sat up and said: "Hell to this!"

Hooper grumbled: "Pretty damn bad, isn't it?"

"Bloody awful beds! Bloody awful blankets! Bloody awful noise!" A large leg came over the side, above the radio officer's bunk. "I'm going!"

Hooper sat up. "There's nowhere to go!"

"There's the aircraft."

"But Bellamy said——"

"This is an airline, not a school. Girls' dormitory . . . boys' dormitory. Hell—who does Bellamy think he is? The headmaster?"

"All the same——"

"He won't find out, anyway." The engineer got down from the bunk. "Are you coming, or aren't you?"

"Well, if you're going, Red——"

Outside, they found the snow had turned to hail. They lowered their heads and ran. . . .

Bellamy and Cavendish were waiting for the long-range weather forecasts. The 04.00 forecasts showed that a marked improvement could be expected in the Maritimes around 20.00 next day. Gander would still be out, but Goose was lifting. New York and Boston, recovered from their sea fog, would both be good.

But along the route, the winds would still be against them, in some zones, as much as ninety knots. Cavendish, after considerable thought, had decided on a Composite track, over the Greenland ice-cap till civilization was reached round the Laurentians and Montreal.

And as Bellamy didn't disagree, he didn't argue, but instead, after Cavendish had set off for the barn, stayed behind to have a chat and a cigarette with Murdoch.

It was very late when at last he said good night and went off to bed. His way led across the ramp. In spite of the icy wind, he turned his eyes up to look at the millions of pounds' worth of aircraft herded there, each under its quilt of snow.

Suddenly a great glow of light shone out into the blizzard. The Emperor among all her dark bedmates glittered from nose to tail in a blaze of glory.

Bellamy walked quickly across to the aircraft. With a frown, he noticed the footprints in the snow around the steps. Then all the lights went out. Blinking in the sudden darkness, he ran quickly up the stairs. He banged on the door. "What's going on?"

There was no answer. He hauled the big door back and stepped through into the cabin.

"It's only us, Skipper," Rawlings's voice said. "There wasn't a hope of sleeping in that barn, sir. And——"

"Get your things," Bellamy said, "and get going."

Then he remembered the lights and tried the switches. The cigar-shaped cabin was flooded with hard illumination.

Bellamy said: "Who put the master switch on?"

The grey curtains of one of the bunks parted. "I did," Lalette said.

Bellamy swivelled round slowly and stared at her. Then he looked back to the others. "Turn the master switch off, Rawlings," he said.

The engineer hurried up the aisle to the flight deck. The cabin once more became dark.

Bellamy said quietly: "Why did you put the switch on?"

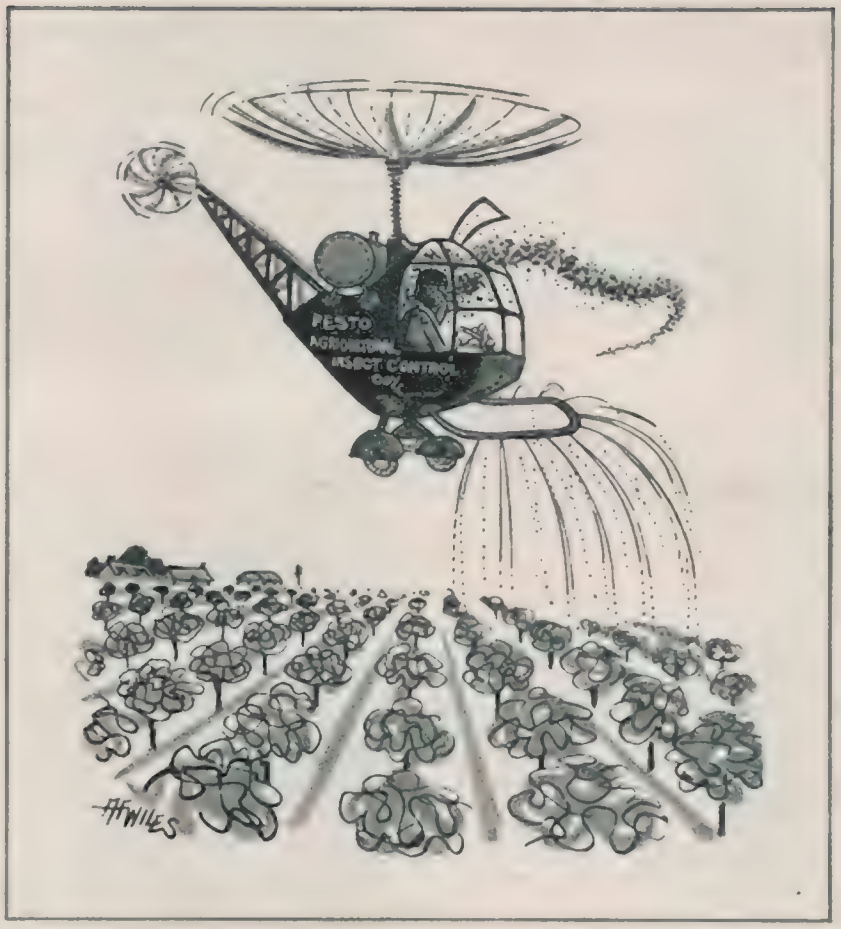
Lalette's voice was low. "To make a hot drink. I'm sorry."

Bellamy said nothing. When Rawlings came back he said: "I'm sorry, Skipper, we didn't mean. . . ."

"I know," Bellamy said wearily. Then, as the two of them shuffled towards the door, he shone his torch for them and said: "Good night."

Lalette called out: "Captain Bellamy. I'm very sorry. About the lights and everything. I . . . we. . . ."

He shone his torch, a little to one



side of her, away from her eyes. Her face looked white and strangely pointed with fatigue. He said: "You didn't touch any of the other switches?"

"No, Captain Bellamy." She moistened her lips. "I'm sorry," she began again flatly.

"That's all right then," he said. "Good night." He turned towards the doorway.

"Good night," she said sadly. She sat still, listening to the sound of his steps on the metal stairway. Then when all was quite quiet, she lay down on the pillow, her mouth pressed into its soft thickness.

"Whew!" Angela sat up in bed. "He needn't have made *quite* such a song about it. After all——"

She stopped. "Lalette," she said. There was no answer.

"Come on," Angela said. "You can't be asleep."

Lalette said: "I'm sleepy. Good night."

Angela listened. The wind still thumped and snuffled the body of the aeroplane. But along with the noises of the storm outside went a quieter one—one that kept mood with the snow and the cold.

Someone else now was crying in this damned aeroplane. . . .

Hooper took the fingers of his right hand off the radio key to give them exercise. He had just finished sending their position, height, outside air temperature, fuel available and the latest weather observations by the pilots.

They had been airborne some hours now, but the delay had fretted everyone and Keflavik had been so crowded with aircraft that it was past eleven o'clock local time that morning before they left Iceland behind them.

He looked out of his porthole. He could just see the two port engines churning their way through a grey mass of cloud that was slowly turning black. *This*, he thought to himself, *must be the front that had been closing down the North American seaboard.*

Then he put his hand back on the key and waited, still listening. The message hadn't been acknowledged. Radio conditions were poor. Then finally, rather faint, in the midst of the crackling and popping of the static, he heard the Emperor's call sign and "R"—Message Received.

He sighed. It was reassuring to know that the rest of the world now knew where they were.

He looked at his watch. It would be past tea-time in his semi-detached house at Hayward's Heath. Jennie would be listening to the six o'clock news. On it she would hear of the Emperor's progress, of which he was the spokesman.

Hamilton, the chief steward, passed him, and he said: "I'd like a cup of tea."

When it came to him, scalding hot and brown, he thought to himself: *The news will be over now. Jennie will have heard about me.*

As it happened, not only Jennie but people all over the world were hearing and reading about the Emperor. The British press gave her a column with

WORK—4

My father taught me to work; he did not teach me to love it.

Abraham Lincoln

the nearly - unanimous heading: WEATHER BEATS EMPEROR: BLOWN TO ICELAND.

The American newspapers, however, had not been so reticent. The New York newspapers announced: WEATHER SENDS NEW BRITISH AIRCRAFT SKEETERING BACK TO SECOND BASE: WELCOME COMMITTEE UP ALL NIGHT AT NEW YORK INTERNATIONAL WHILE BRITISH FLIERS KIP DOWN IN ICELAND.

The Emperor, meanwhile, regardless of the comment and interest of the world, now flew comfortably on under her anonymous grey blanket of cloud. The tea in Hooper's hand was still hot and sweet.

In front of him, he heard Bellamy say: "Getting darker. Put the propeller anti-icers on." Out of his porthole now he could hardly see the port inner engine, the stuff was so thick. He felt an updraft tremor through the wings. He thought to himself: *better drink this up before it gets too bumpy.*

He brought the cup up to his lips and was just sipping at it when there was a sudden violent swing to port, and the whole cupful, burning hot, was dashed over his face.

He cried out in pain, but nobody heard him. Bellamy had slammed out the auto-pilot and was straining his right foot against the rudder pedals. And then, just as suddenly, the great tail swung round and they careered well over to starboard in a horrible skidding motion.

Rawlings yelled: "It's the engines! The outers are cutting!" He had seen the momentary immense drop on the fuel flow-meters.

Bellamy shouted back at him: "Throttle them both right back then."

He watched two levers on the throttle pedestal move backwards. But by that time the Emperor was flying perfectly normal again.

The pilot turned to Rawlings. "What the hell happened there?"

"The outboards cut. One after the other. That's why we swung."

"Which cut first?"

Rawlings looked at the flow-meters. "Difficult to tell, sir. Happened so quickly."

"One cut in and came on again . . . then the other did the same?"

"Think so, Skipper. Only momentarily . . . both of them."

BELLAMY couldn't understand it. There had been some mysterious yawing and tail waggling earlier in the flight, but it hadn't been serious or prolonged. Was this new development anything to do with that?

Bellamy looked out at the clammy cloud that was now moving the Emperor up and down in unsteady bumps. "Couldn't be ice," he said. "Not at this temperature." Then he saw the speed dropping rapidly—180 . . . 170 . . . 160.

"Better bring the outboards in again, Mr. Rawlings. All the instruments reading correctly?"

"All of them, sir."

Bellamy's face was wrinkled up in worried concentration. "Damned things! What the hell could have happened?"

Nobody on the flight deck answered him. Hooper's eyes, far away from his radio now, were glued to the engine instruments opposite him. Even Southwaite, the navigator, had stopped work to hear what was going on.

Into a tense, expectant silence came Captain Cavendish from the rest compartment. "What happened then?"

Bellamy explained the engine cutting. Cavendish listened with his head on one side, and then said: "I feel I shall have to stay up here at the front."

With a shrug, Bellamy climbed into the second pilot's position. Then, when they were sitting side by side, he suggested to Cavendish: "How about having Cruttwell up? After all, they're his engines."

"You think it might come on again?"

"Might. Better put the seat belt sign on, too. Just in case." He leaned back and turned on the switch.

The illumination of the seat belt sign just stopped the chairman making a determined assault on that last privacy of pilots, the flight deck.

Now, strapped in with the others, he sat in a frenzy of concealed irritation, parrying Brocklehurst's questions. The first great lurch had sent him hurtling against the under-secretary's sharp shoulders; and no sooner had he disengaged himself than the swing to the right had sent the man's bony elbow deep into his stomach.

"What could it be, Sir James, do you think?" Brocklehurst asked.

It was the same question the chairman was asking himself. "Expect somebody sat on the switches," he said, but his laugh this time rang hollow.

"It will not be repeated, I hope," said Brocklehurst.

"Captain Cavendish will want to know the reason why, if it is."

"And all this strapping in?"

"Can't you see the cumulus, dear fellow? Cavendish is only making sure we don't get hurt."

Brocklehurst chewed over this information in dubious silence.

Lalette, sitting beside Angela, heard the other girl's fast breathing and saw the fear in her wide eyes. "It's all right now," she whispered, pointing

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out at the rotating propellers. "Look—everything's working."

Cruttwell came forward. Called upon to explain the curious behaviour of his engines, he stared at all the dials, which now read exactly as they ought, listened to the pleasant purr outside, scratched his bald head thoughtfully. Then he said: "Could it be ice on the intakes?" That would prevent the air from getting into the engines, again causing them to cut.

"Hardly any ice outside," Bellamy said, and pointed to the few crystal spots that ornamented the windscreen.

Cruttwell hesitated. When he spoke again, he said his words timidly, as though he expected to be contradicted, "You know . . . back there, it didn't *seem* to be an engine."

Rawlings growled. "Well it was!"

"It's all right now, Mr. Rawlings."

"Sure . . . but for how long?"

Because there was nowhere else to sit where he could study the engine instruments, Cruttwell squatted cross-legged on the floor of the flight deck, staring fixedly at the dials.

"That was a bad bump," Cavendish was saying when the nose of the Emperor dipped slightly, and then rocketed off to the left.

"Here we go again!" Southwaite murmured.

The aircraft was behaving as though it had suddenly lost its head. Off it careered, this time to the right. "Put full left rudder on!" Bellamy called, and the pilot's legs jammed tightly against the dual control rudder pedals.

"Doesn't move an inch!" Cavendish yelled. "Can't get it to budge!"

Bellamy's face, screwed up and red with the effort, dripped with sweat. The Emperor seemed to be flying sideways, like a gigantic crab. Then suddenly, as though released from what was holding her, she gave another great lurch to the left. Light hail pattered on the windscreen, and, out of the inky-black, unseen updraughts punched at the fuselage and tilted the wings.

"I'm scared of the tail," Bellamy shouted. "Won't stand much more battering like this." And then louder, in anger and exasperation, he yelled: "Anything showing on those damned instruments?"

Rawlings called hoarsely back: "The outboards are cutting again. Then they're coming in again. . . one after the other. That's why we're swinging." The engineer throttled back engines one and four.

"These damn rudder controls!" Cavendish roared. "What's gone wrong with 'em, Bellamy?"

"How about throttling back all four?" Bellamy suggested. "See if it stops the swinging a bit."

But Cavendish was anxious to get out of the turbulent wet air of the cloud. "I'm going to get on top of this stuff first." He turned back to the engineer. "Give me take-off power on all four."

The motors roared up again, only to die out on the port side. They were still going crabwise. "It's the controls," Bellamy said. "Must be!"

THE Emperor struggled up through the cumulus, her airspeed dropping farther and farther back on the indicator. Her great sideways sweeps continued. And now, as the violence intensified, all that became important was the necessity to survive. What was causing the seventy-ton aircraft to dance this mad witch-doctor waltz became secondary. All thoughts were whistled clean out of everyone's head but the paramount need to hang on and live.

Both pilots, straining together, each on their own set of controls, tried to curb the Emperor's capers. But still she skidded sideways, skating helplessly in the snow-filled gloom, her motors fluctuating violently, all four engines now cutting alternately in pairs, first the port pair, then the starboard. With sickening judders, her whole airframe rocked and shivered. The wings shimmied up and down, bending and giving in the rough air.

"My God!" Rawlings gasped. "This is it."

Bellamy and Cavendish did what they could for her in her paroxysms. Hanging on, they straightened her wings when they dropped. They tried to get her to climb higher, to top the bad weather. But her airspeed was too low. In between her skids, she was mushing badly.

At the back, the passenger cabin was heavy with the smell of fear. They all sat, silently now, strapped in, waiting for the end. But then, as the buffeting went on, sick and tired though they were, the fear began slowly to dissolve into an agony of helplessness.

They watched the cloud outside. They seemed to tense themselves every time another violent swing was expected, as minute by minute the Emperor lurched onwards.

Then the bumping suddenly stopped. The yawing from side to side went on and the Emperor, as though the tune of the devil's dance was still inside her head, slid to and fro for a few minutes in the clear air. And then, like a queen caught red-handed in a wild party, she suddenly pulled herself together, and flew on over Labrador, steady and stately.

Bellamy watched her with wary disbelief. There was a clear horizon ahead, full of greens, yellows and blues from the northern sunset. They had passed the front now—the air temperature had shot up fourteen degrees. Gradually, the darkness was closing in on the hundreds of square miles of cold desolation below.

But inside the Emperor the lights were full on, people began to recover, ask questions. Life revived. For nearly an hour more, Cavendish kept them all strapped in, just in case the Emperor suffered another outburst. But everything went on smooth and calm and untroubled. And he reached up his right hand and flicked off the seat belt switch.

The chairman was up at the front first, at last able to burst in to this topsy-turvy pilots' world from which he had been so long excluded. In his agony he couldn't wait to reach the pilots' seats, but from the cockpit door burst out to Cavendish: "You didn't radio that anything was wrong, did you?"

Cavendish turned round, surprised at the loudness of Sir James's voice. "No sir. I didn't."

The chairman gasped with relief. "Thank God for that!" he said. Then a flood of questions flowed from his lips. "What is it? How bad is it? Can it be rectified in New York?"

To all of them, the technicians shrugged their shoulders and said they didn't know, they couldn't say exactly. Sir James observed grimly that they'd damn well better find out, and stumped back to his seat in angry silence.

The rest of the passengers had been thoroughly frightened. And when, somehow or other, the frantic capers had ceased, and just as they had thought life was about to end, life began again, their relief was boundless. But after talking it over, and trying to smile, they remembered the miles yet to go.

EVERYONE retreated into his private thoughts, fearful that at any minute the Emperor would start acting up again. There was something wrong. By now, all on board were convinced of that.

Up at the front, Bellamy stared out at the beginnings of the night, looking anxiously for signs of bad weather. There was a wisp or two of cloud, nothing more. He turned over in his mind what could have caused the Emperor's dangerous antics. Moodily, he hauled out a packet of cigarettes and offered one to Seawood, who had replaced Cavendish in the left-hand seat.

"Thank you, sir." Seawood took one, and said: "Nasty while it lasted."

"Very nasty," Bellamy said. Then he added: "Must have been pretty vile at the back, wondering what the hell was happening."

"But what *was* happening, sir?"

Bellamy shrugged his shoulders, and jerked his thumb backwards to where Rawlings, Eastlake and Cruttwell, their voices raised, were arguing hotly about the same subject.

"I think it was the boosters . . . but the engines *were* cutting," said Bellamy. "Anyway, I'm not going to compete with the experts."

Unconcerned with the fears and worries inside herself, the Emperor slid into the slowly forming night. High above their heads, the same old stars trooped out again, bright and beautiful as ever.

And then, one by one, below them the little lights pricked through. Trappers' cabins in Northern Quebec showed up their tiny yellows; a mining village made its minute Milky Way on the ice and snow.

The Emperor flew high above the beginnings of the Laurentians, and then above the great, glittering sea of light that was Montreal. She passed to the left of the great cross of lights on the top of Mount Royal and, making no attempt to divert to the airport at Dorval, joined the airway for the last hour's flying to New York. Cavendish came up to claim his command for the final finish.

Everybody had a wash and clean up. Everybody looked down at the lights, now bearing them company all along the route, and thought warmly: this is almost as good as being on the ground.

Brocklehurst coughed. Then he spoke for the first time in two hours, nodding his head at the illuminated ground beneath.

"Awfully pretty sight," he said. "Awfully pretty. . . ."

High in the sky, for many miles around New York, hangs a complicated network of invisible roads. Along these tortuous by-lanes flow the world's airlines out of New York; and, especially dog-legged to avoid collision, the arrival of traffic pours in.

Over Poughkeepsie's cone, Cavendish checked in, and Poughkeepsie replied with a cheerful American "Roger, stand-by for clearance." But when it came, to Peekshill only, tagged on to the end of an instruction to maintain 24,000 feet was New York's latest weather: wind south-east five knots: visibility half a mile in slight drizzle.

Cavendish said furiously: "Stuff's come in off the sea again. After all that, they're going to stack us up." He turned to the engineer. "What's the fuel state?"

"Less than three hours, sir."

New York came up with their clearance, first in a slow drawl: "Emperor . . . Alfa Delta——" and then crisp and clear and very fast. "Alfa-Delta-cleared-to-Westchester-direct-Glencove-direct-Idlewild-range-direct-Scotland-cross-Glencove-22,000-Idlewild-19,000. Hold-in-the-pattern-at-19,000. Expected-approach-time-02.14."

With some prompting from Seawood, Cavendish repeated it back. Then he snapped: "Zero two one four! That's a long time to wait."

"Must be a full stack," Seawood said. "All that bad weather, I suppose. Flood of delayed aircraft converging on Idlewild."

Cavendish started to let down. Over La Guardia, suddenly all the lights on the ground went out. Now and again, in the clear darkness, the navigation lights of other aircraft showed up a vivid red or green. They, too, went out as the Emperor once more nosed into cloud.

At Scotland beacon, Cavendish dutifully reported at 19,000 and, throttling back to save as much fuel as possible, started to go round and round the mulberry bush of the holding pattern.

Cavendish gave a sigh of exasperation. It was over a quarter of an hour before they were cleared to descend to 18,000, on the first leg of their descent.

Gradually, the Emperor crawled downwards, while her occupants, tired out, could do nothing but sleep and wait. Bellamy had closed his eyes in the rest compartment, his arms and legs stiff from battling with the controls.

In the passenger cabin the chairman, stirring a cup of coffee Lalette had given him, was methodically and grimly sorting out in his mind the innumerable problems that awaited him when at long last the Emperor set her wheels down on American territory.

ONE by one the aircraft in the stack touched their wheels down on runway zero four through the thick grey mist that came rolling in from the sea. Zig-zagging painfully from side to side, the Emperor, at last number one to land, her wheels down now, her landing check complete, flew lower and lower into a woolly, unseen, unwelcoming world.

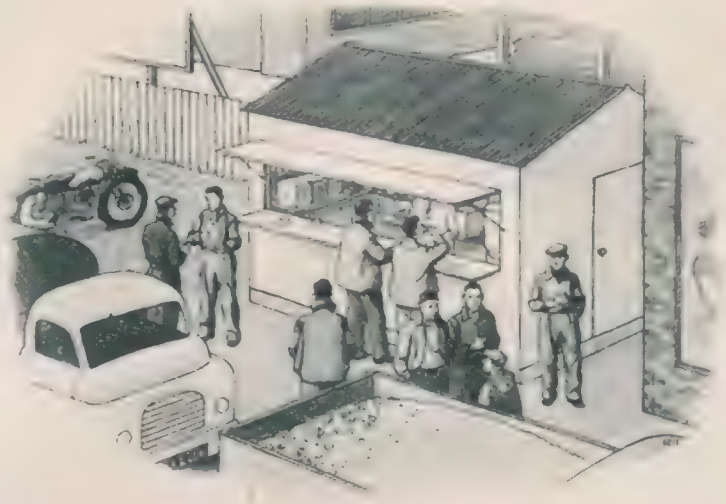
"Come right in, Alfa Delta," said the new, friendly voice of Idlewild Tower. "Clear to land."

Cavendish punched the stop-watch on the instrument panel, and put down flap. Alfa Delta descended. Half a minute went by, and the aircraft was still in a grey-black stew. Her navigation lights reflected back on themselves in a mizzly gloom. At four hundred feet indicated, there was still nothing.

The speed fluctuated round 125

Spot the Lawbreaker

Somewhere in this scene, the law is being broken. Can you see where? A barrister gives the answer on page 51



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knots. Then Cavendish, noticing how low he was, started to pull the nose back. Discouraged, the needle fell back further—122 . . . 118 . . . 116. . . .

"Approach lights!" Seawood shouted. "Starboard! Starboard!"

Cavendish raised his eyes from his strict surveillance of the instruments and looked out. Below the nose, a few hundred yards ahead, a portion of the dark air had smouldered into a sullen red, and then two stubby lines, slightly inclined towards each other, seemed to burst into flames.

The pilot swung the Emperor to the right. As he did so, the speed dropped to 110 knots. Cavendish, lined up now with the lights and anxious to be down, called to Rawlings to reduce power to 7,000 compressor r.p.m.

Seawood murmured: "You're undershooting."

The Emperor wallowed. The tail began to swing again. Before reaching the first approach light, that jutted out seven hundred yards into the water, the aircraft started to sink. Cavendish pulled the nose up, and called for 7,500 r.p.m.

Rawlings, to be on the safe side, as he always did, gave him an extra thousand. The Emperor still sank.

The first light went by, apparently just under the wing. Southwaite saw it, with a little ring of reflected light round it in the still water. Hooper got a glimpse of it, too, and muttered: "God . . . we're low!"

Cavendish called for 8,000 r.p.m. Rawlings gave him over nine thousand. The speed flickered round a hundred knots. At that low speed, with the heavy drag of flap and undercarriage down, there was difficulty increasing it. They seemed to be skimming just above the water.

Four more lights went by. In the gloom, they could see the beginnings of the runway lights now. Seawood saw in horror that they seemed to be *above* the aircraft.

Runway zero four at Idlewild juts out like a breakwater, dropping at its beginning a clear twelve feet down into the sea. The Emperor struggled just above the water. Only two of the red lights remained before the threshold which shone misty and green a hundred yards away from them.

The aircraft's tail frantically juddered. Her nose came up. Cavendish called for 10,000 r.p.m. What he got was nearly all the power available in Cruttwell's immense engines.

SEAWOOD was sure the aircraft started to climb *up* to the runway. He saw a black wall, perpendicular and unyielding, dead in front of them. He thought to himself: there goes the undercarriage on that sharp cutting edge. The nose was shaking to and fro as though it was in a fit. The whole aircraft was in a begging attitude. The Emperor was on the point of stalling.

Then somehow or other, shuddering all over her body, she started to climb. She rose above the wall. The threshold lights flashed by.

Cavendish, realizing they were climbing, called out: "My throttles!"

"Your throttles," Rawlings echoed him.

Cavendish was surprised to find the four throttle levers so far forward. He took them in his gloved hand and pulled them suddenly back. The Emperor seemed almost to stop dead in the air. Deprived suddenly, a dozen feet above the ground by now, of all the immense power by which she was literally hanging on her propellers, the Emperor shook and shivered. The left wing dropped. Everybody on board had a horrible sensation of going down and down and down.

Then the port wheel connected with the wet runway, giving it a tremendous thud that made the whole aircraft quiver like a leaf, only to be followed a second later, by an even more fantastic noise as the starboard wheel thundered on to American soil.

Southwaite peered out into the night to make certain that the undercarriage legs hadn't crashed through the wings. Then in his log he wrote: "Touched down Idlewild, 02.31."

To be continued next week

Wizards at War

Continued from page 13

hail of cannon fire on an open bridge whenever an aircraft attacked them. Armour plating was out of the question; because of the nearness to the compass it would have to be of the non-magnetic type, and there was none of this to spare in the country. The only substitute was a structure of concrete blocks built round the bridge. But the concrete slabs were proving more dangerous than protective. They cracked and splintered. Often the entire structure would collapse, and once the bridge was out of action the ship was at the mercy of the bombers.

It was Lane who came upon the first slender clue. When he first arrived in the department, Goodeve put him on to help another officer named Terrell, a barrister, with the analysis of intelligence reports, and one morning, reading through an account of an air attack on a ship at Dunkirk, he came across a marginal note which intrigued him.

"I noticed that whenever machine-gun bullets struck the deck there were no ricochets," wrote the commanding officer. "The surface of the deck is covered with a cork-filled mastic substance to aid waterproofing." Lane read this again, and took it over to Goodeve.

"Do you think this is worth following up, sir?" he asked. "If the makers could produce thick slabs of this stuff it might give some sort of protection to ships' bridges and gun positions."

"Check on the makers and give them a ring," said Goodeve.

After that, things moved fast. Lane found that the mastic—a bituminous cement rather like asphalt—was made by a London firm. He ordered four sample slabs, and on August 17, a sunny Saturday afternoon when the Battle of Britain raged over Southern England, Terrell took a revolver and the four targets down to the Road Research Laboratory at Harmondsworth. Setting them up near the laboratory he fired at them, first with the revolver and then with special armour-piercing bullets. The results were disappointing. All the rounds went straight through the slabs.

"I've got it," said Terrell. "We want two *different* layers for the bullet to penetrate. If we put a thin steel plate at the back of the slab that might do the trick."

They tried again with the same mastic slabs and a backing plate. This time there was a slight, but quite definite improvement. Greatly excited, Terrell rang up Goodeve.

"We've got the answer. If we order another lot of samples we can get them to mix in different types of stone instead of this cork filling. We should be ready for another trial in forty-eight hours."

The next day Terrell had another idea. He had once been briefed to appear in a law suit for a Cornish quarrying company, and he recalled some figures showing the tremendous crushing strength of granite.

"Can you make me one extra sample this time?" he said. "In the fifth slab I'd like you to mix some granite chippings in with your mastic stuff."

When the trial was held it was the fifth sample which showed spectacular results. Several armour-piercing rounds barely reached the steel backing plate.

Terrell was certain now that the department was on the brink of its first major success. All that remained was to discover an exact formula. He had to find the right size of granite chips and the right proportion for mixing the granite with the mastic.

Working day and night, the Road Research Laboratory staff soon produced new samples, further strengthened by specially screened chippings of granite. H.M.S. Excellent, the gunnery establishment at Portsmouth, heard about the new armour and offered to let their experts test it. At Whale Island, they subjected the tough, yellowish slabs of stone-filled mastic to the most exhaustive trials they could devise.

"Shall we start with reduced charges?" said the Lieutenant-Commander in charge of the firing party.

"No . . . that won't be necessary," said Terrell. "I think it will stand up to anything you can do to it."

And it did. From varying angles and distances they fired round after round at it, and the hard cores of the bullets broke up in the mastic. In one series of eleven rounds, ten never even made a bulge in the steel backing plate. After trying in vain to ignite the armour with blowlamps as a final experiment to test its resistance to fire, H.M.S. Excellent reported in glowing terms.

Soon Plastic Armour was arousing much interest in the Admiralty, and Terrell put some slabs of it on display in the department for a party of very senior officers to inspect after lunch one day.

Examining it while Terrell was at lunch Norway made the entertaining discovery that it was quite possible to insert a drawing-pin in the armour plate between the granite chippings. When the V.I.P.s arrived the largest slab had a printed card pinned to it: PLASTIC ARMOUR—THE ONLY ARMOUR PLATE WHICH WILL TAKE A THUMB TACK!

Within a year the success story of Terrell's Plastic Armour could be charted in impressive statistics. It was made in nearly every seaport in the United States, after one of Goodeve's team had enterprisingly enlisted the aid of the New York Police Department's Homicide Section to experiment with different types of quartz on their range at Hackensack, New Jersey. And the U.S. Navy Department statisticians worked out that the new protection saved over 44 million dollars worth of special steel alone.

From Plastic Armour an even tougher protection was developed. Most of the landing craft which took part in the invasion of Europe were armoured with the plating and, in all, some ten thousand ships were fitted with it before the war ended.

Terrell, whose energy and persistence drove the project to success, stayed with the new department until the production of the armour was in full swing. Today a slab of Plastic Armour in the Imperial War Museum records the department's first triumph, and Terrell's part in it was marked by an award of nearly £10,000 when the Royal Commission came to assess the value of wartime inventions.

GOODEVE and his team had not been operating long when Vice-Admiral Somerville left to take up an important appointment at sea. Though they had lost their influential sponsor his Wheezers and Dodgers were now getting well into their stride. Besides Plastic Armour there were many other projects afoot.

The department had for some time been working to adapt for sea service an ingenious R.A.F. device called the Parachute and Cable—or P.A.C.—and soon their efforts brought forth success.

The name of Schermuly had been familiar to seamen for more than half a century. Old William Schermuly had invented the life-saving rocket apparatus adopted throughout the world, and when the war came the firm's long experience of explosives was put to full use. To its factory, hidden in a Surrey wood, came demands for a wide variety of devices. One urgent need, which was explained to the three Schermuly sons now directing this unusual family business, was for a form of airfield defence against low-flying aircraft.

The brothers quickly designed a powerful rocket which could carry a steel cable up to a height of five hundred feet; on the end of the cable was a parachute.

An aerodrome ringed with P.A.C.s could provide its own emergency "balloon barrage" at the touch of a switch, and enemy pilots soon found that low-level raids brought a new hazard. One Dornier blew up over Kenley after its port wing had been torn off by a P.A.C.

It was soon realized that the device might be a valuable deterrent at sea. Aircraft attacking a ship at masthead height could drop their bombs with deadly accuracy, but it seemed doubtful whether a pilot would be keen to hold on his course if he knew that he might become entangled with a mass of wire and the dragging deadweight of an open parachute.

The P.A.C. was a fascinating apparatus. To make the parachutes, the department enlisted the aid of the soft furnishing department of an Oxford Street store, and using linen and nylon cord the firm produced a tremendously strong canopy. One of the parachutes pulled the wing right off an old Wellington which was lent to the department for trials, and later on a German aircraft which had the misfortune to pick up several P.A.C.s at once was dragged to a standstill in mid-air.

P.A.C.s were fitted to merchant ships and by the spring of 1941, encouraging reports began to come in. The mate of one small ship in convoy, the Fireglow, was standing near the windward P.A.C. when a heavy air attack developed. Seeing one German bomber diving from dead ahead he pulled the lanyard, and up soared the

Spot the Lawbreaker

See page 49

THE Food Hygienic Regulations, 1955, provide that "every stall at or from which there is carried on any food business . . . shall bear conspicuously the name and address of the person carrying on the business." The maximum penalties are severe, says a barrister-at-law: three months and a £100 fine.

CHEW

You feel better, do better,
when you chew **Wrigley's**
Spearmint Chewing Gum,
with the lively, refreshing
taste that lasts and lasts.

Healthful · Refreshing · Delicious

EP47/56

That note of truth she heard too late . . .

'CHOPSTICKS'—a funny little tune to lead to romance.

It was at a party. Janet was idly picking out the tune on the piano and Ted came in with the harmony. In the weeks that followed, life was all harmony for them, until—dates began to dwindle, there were fewer telephone calls . . . Without a hint of the reason, the romance was over.

Poor Ted was too embarrassed to tell her the truth—that her bad breath was putting him off. It was not until some weeks later, on a routine visit to her dentist, that Janet got a hint of the trouble.

She happened to ask him why she so often woke in the morning with a nasty stale taste in her mouth. 'Morning mouth' her dentist called it, and told her the reason.

WHILE SHE SLEPT

'You see,' he said, 'there are crevices in teeth and gums which harbour tiny scraps of food. These particles decay while you sleep, causing that nasty "bad breath" odour which can last *right through to the evening* if you don't do something about it.' And he recommended Mentasol Toothpaste. The odour-killing chlorophyll in Mentasol reaches the source of odour in seconds, and stops bad breath for hours.

Why not brush *your* teeth with Mentasol Chlorophyll Toothpaste? It will help to keep your whole mouth fresh, clean and healthy.

Mentasol

THE CHLOROPHYLL TOOTHPASTE

cable. A large section of the plane's wing was dragged off by the wire, and the aircraft came down in the sea.

Skipper Soames, of the Milford Queen, had a successful encounter with a Dornier 17. His guns had hit the bomber on its approach run, and when the P.A.C. was fired it wrapped itself firmly round the Dornier's wing. Losing height rapidly, the aircraft disappeared into the haze, and a few seconds later the Milford Queen's crew heard a loud explosion. Skipper Soames was certain that his P.A.C. had destroyed the attacker.

Soon significant evidence began to filter from the German side. An enemy bomber pilot on leave was overheard by one of our agents discussing the hazards he had to face. "It's no joke, I can tell you," he complained. "The English are shooting up these spirals from their ships and you're lucky to get home at all with a thing like that wound round your airscrew." The captured crew of a Junkers 88 were interrogated. They had been carrying out regular shipping reconnaissance flights, and from one of these, off the east coast, they struggled back to their base with a huge gash in one wing, between the engine nacelle and the fuselage. "We could not understand it. It looked as if it had been caused by a wire attached to a rocket," said their captain.

A coaster on passage from Dover to Hull had two of the rockets installed, and the firing lanyards straggled somewhat untidily from the mounting into the wheelhouse. Off the Essex coast the ship was suddenly attacked by a dive bomber, and her master, hearing the roar of the plane, rushed from his cabin to the bridge. As he entered the wheelhouse he tripped over the lanyard of the starboard P.A.C. and fell flat on his face, knocking out several front teeth. There was wild cheering, and he picked himself up angrily. But the uproar on deck was not to mark his misfortune. In falling he had fired the P.A.C. with his foot, and the German plane, flying straight into the trailing wire, had plunged into the water.

EARLY in 1943 the apparatus came off the secret list and the department was able to tell the workers in the Surrey factory something of what the device had achieved. Nine enemy aircraft were known to have been destroyed, and at least thirty-five ships claimed that they had been saved from destruction by the "spirals" which the German aircrews feared so much.

The P.A.C. was a weapon of passive defence. The department also worked to give the merchant navy armament with which it could hit out at the enemy. Their research centred around experiments with rockets.

There was a shortage of conventional guns for arming merchant ships, and the rocket seemed the only substitute. Goodeve realized that rocket weapons offered the only immediate hope for the merchant ships, and the team began its own programme of research and development under Nevil Shute Norway. It was not until the department turned its attention to a device called the Harvey Projector that real progress was made.

With the backing of Professor Lindemann, Churchill's scientific adviser, the Harvey Projector had been made in large numbers for the army. In appearance, it was starkly functional; several pieces of gas-piping were mounted on a pedestal composed mainly of other pieces of gas-piping. It had tin shields on either side and into these was built a glass window with crossed lines to provide a rough sight.

Down the centre ran two rails, and on these lay a single rocket shell. Over nine feet long, the shell had an aerodynamic brass fuse in its nose, carried nearly a stone of high explosive and cordite, and was capable of travelling at least seven miles. The firing mechanism was actuated by a small torch battery and a household bell-push.

At first sight the Harvey was an unpromising weapon for sea service, but the navy was in no position to pick and choose, and Norway went to work on it at the Ministry of Supply's rocket testing range at Aberporth, on the Welsh coast near Cardigan. His team included Jack Cooke, Ian Hassall—who had been a welter-weight boxer, an artist, a cow-puncher and a sailor—and a redoubtable and inventive young R.N.V.R. officer called Alec Menhinick.

When Menhinick was posted to the department, he felt certain misgivings, and spoke to Goodeve.

"You know I'm not a scientist, sir," he said. "I can hardly add or subtract."

Goodeve led him to the door of his room. "Look, Menhinick," he said. "Out there are all sorts of clever chaps with slide rules who spend all day adding and subtracting. If ever you have any adding or subtracting to do, just give it to them."

Alec Menhinick had wanted excitement. He was to find it with the Wheezers and Dodgers.

Norway's team had almost completed their modifications to the Harvey Projector when a large party of senior army officers and civilians came to Aberporth for a demonstration.

Hassall and Cooke were allotted a star rôle with the Harvey, and as they stood to attention in their concrete emplacement high on the cliff-head the generals gathered round and gazed at the huge rocket lying on its rails.

"I suppose you can't get much accuracy with these contrivances," said one of them.

"Oh, I don't know about that, sir," said Hassall airily. "It all depends how they're handled, you know."

Glancing out to sea, where the guns had been firing all morning at a glider target suspended below a balloon, he added, out of bravado:

"Would you like us to see if we can do something really difficult . . . how about cutting the balloon cable away from the ship, for instance?"

The generals looked astonished. At a range of one and a half miles they could barely see the cable. Actually, the Harvey Projector had no precise accuracy at all, and no one knew this better than Hassall. But he would have to go through with it now.

On the previous evening he and Cooke had rehearsed a meaningless jargon of shouted commands to impress their visitors, and as they began bellowing at each other the generals backed away from the projector. With a belch of flame the rocket left the rails.

Now it was Hassall who was astonished. The balloon jerked and rose slowly away from the ship, its cable dangling. With a single, incredibly lucky shot the Harvey had cut it from its moorings.

The first Harveys to go to sea were fitted to some large banana ships converted to carry out independent patrols in the North and South Atlantic. But the really spectacular career of the Harvey did not begin until a group of scientists who had been working at the university at Exeter produced a remarkable new proximity fuse, an uncanny robot which itself determined the right moment to explode by responding to the changes in the intensity of light near to an aircraft in the sky.

The new fuse was top secret. It was so top secret that when a supply arrived at Belfast for use on the S.S. Alleghany, the department men there—Cooke, and a civilian named Horsley—knew only a little about it.

The Alleghany was being equipped with three Harvey Projectors, and when Cooke and Horsley sailed with her to test them they had to fit the new fuse to seventy-five rockets. The captain ordered all hands off the upper deck while they worked. Then they had to fire a trial round from each projector.

They walked over to the Harvey on the poop. Cooke elevated the projector. They counted "One . . . Two . . . Three," and he flicked over the switch.

The rocket left the rails with a roar, and they saw a white puff of smoke in the far distance. They were still congratulating themselves when an angry shout came from the bridge.

"What do you think you young fools are up to? Look at my ship!"

They turned and looked. Bridge, mast and funnel were smothered in mashed potato. In their anxiety over the fuse they had completely forgotten the Harvey's terrific flame blast: When they fired the first round the blast had swept through a latticed locker used for storing vegetables, pulping the entire contents and distributing them over the upper deck.

When they fired the second projector, a huge baulk of timber was hurled right across the deck and through one of the lifeboats. But it was not until they tried the third that they struck really serious trouble. When Cooke pressed the firing switch the rocket remained inert on the rails. A hang-fire was what they had dreaded all along, as nothing was known about rendering the fuse safe.

While they stood over the Harvey, wondering what to do, a cheerful voice boomed: "Can I give you a hand, sir?" and an immense chief gunner's mate appeared.

"We've got a hang-fire," said Cooke.

"You don't want to worry about that, sir," said the C.G.M., reassuringly. "I'm a bit of an expert on hang-fires. Had two of them in the Nelson. If she hasn't gone off thirty minutes from now, we'll pitch her over the side."

The round was safely ditched, but by this time the captain had had more than enough of the Harvey Projector and its operators. Ordering a boat to be lowered he roared:

"Put those two gentlemen ashore!"

Cooke and Horsley were dumped on the nearest beach and left to find their way back to Belfast.

The spring of 1941 brought a sharp increase in shipping losses. Enemy aircraft alone sank more than half a million tons—mostly in coastal waters—and the Harvey did not have to wait long for its baptism in action. Menhinick had fitted the Projector into an ocean boarding vessel, H.M.S. Patia, and on the evening of Sunday, April 27, he sailed in her on her maiden voyage in naval service.

When she left South Shields Patia headed north, and by dusk she was approaching the Farne Islands. There had been no warning of enemy air activity, and Menhinick was in the wardroom when he heard a sudden stampede on the deck above and, almost simultaneously, a loud roar of engines and the whistle of bombs. In the gathering darkness no one saw the Heinkel as it came in at wave-top height, and Patia shuddered as one bomb scored a near-miss.

Patia's gunners were waiting for it when the second attack came. The barrage from the ship appeared to disconcert the bomb-aimer, and Menhinick, manning his Harvey on the starboard side, saw two more bombs fall harmlessly.

The Heinkel then went away in a wide circle and came back, much more slowly, from dead astern, raking the decks with machine-gun and cannon fire, causing heavy casualties. Among them were several of Menhinick's seamen gunners, and their places for the fourth and final attack were taken by cooks and stewards.

CIRCLING again the Heinkel made its run in from the port quarter and dropped three bombs very close together. One fell right under Patia's stern; one hit amidships; and the third was a near miss level with the bridge on the starboard side. The Heinkel's machine-gun fire had already smashed the sights from the Harvey, but when the plane was only a hundred yards or so away Menhinick got a direct hit on its tail with one of his rocket shells. The bomber yawed violently, a bright flash of light blazed out from under the fuselage, and the plane came down in the water off Patia's starboard bow.

By now, the ship herself was a shambles, and sinking fast. Weak from loss of blood—he had been shot in the neck—Menhinick crawled to a Carley Float which was launched a shade too late and was sucked down the funnel as the ship dived. The float bobbed free, but as it rose it struck the searchlight platform and the half-drowned men clinging to it were dragged under again. Miraculously, they were all still holding on when the float finally surfaced, and they paddled away from the centre of the debris.

Not far from them they saw the vast shape of the Heinkel lying on the water. The Germans were busy launching a rubber dinghy, and an elderly pensioner, Chief Petty Officer Prior, dropped off the float and swam towards them. The only weapon he had was a large pocket knife, but when he reached them he brandished this fiercely, threatening to rip the rubber dinghy to shreds unless they let him climb in.

He then ordered the wet and frightened Germans to throw their revolvers overboard, and informed them in lurid and unmistakeable English that they were his prisoners.

In the bitter cold and darkness of the North Sea the hours that followed were a nightmare. On one Carley Float Patia's captain and first lieutenant died of exposure. Of the eighteen men clinging to Menhinick's float twelve froze to death, and when the French trawler Chassiron picked them up after six hours in the icy water another seaman died before they reached port. In all, 119 of Patia's ship's company lost their lives. But the Harvey had accounted for its first enemy aircraft.

NEXT WEEK: Churchill asks for minefields in the sky

"He's passed his crisis. Keep him absolutely quiet and get ready to go into yours"

WORK—5

I like work; it fascinates me; I can sit and look at it for hours.

Jerome K. Jerome

Spinning hair into gold

Continued from page 19

merely hair without colour pigment. Hair grows three-quarters of an inch a month on average, and even if a shock suddenly stopped the body producing pigment it would take several months and several haircuts before all the coloured hair had been replaced by white.

Dr. Agnes Savill, the leading British authority on the hair and scalp, disagrees. She says that cases of sudden blanching have been reported by so many competent observers that "the existence of the phenomenon is probable."

A possible explanation is that altered circulation may allow the cells to loosen and admit air which forms bubbles. These reflect the light and make the hair appear white.

In police work, hair found at the scene of the crime is of strictly limited help to the detective. Although an expert may be able to tell him the owner's age, race, probable sex, how the hair was removed, whether it has been recently cut, singed or dyed and from what part of the body it has been taken, he cannot say it came from a particular person.

Dr. Keith Simpson, the Home Office pathologist, recently quoted a case where three hairs taken from the clothing of a suspect were "absolutely identical" with the hair of a murdered girl. The police took samples of hair from the man's relatives—and discovered that his wife's hair was identical with that of the dead girl.

Surprisingly, the medical profession as a whole takes little interest in the hair. In recent years, only two British doctors have specialized in the treatment of the hair and scalp. One of them is dead; the other retired. The subject has thus become a sideline of the skin specialist. Perhaps that is why so little is known about the commonest hair complaint of all—baldness.

Doctors know that falling hair does not necessarily imply baldness. All the time, the hair is renewing itself and new hairs are pushing out old ones which have "lived" for an average of eighteen months. In this way, everyone loses between forty-five and eighty hairs a day.

In some cases of baldness, the roots have not died but are merely sluggish. Regular massage may stimulate them to start producing hair again. That is why hair restorers occasionally work. What really does the trick is massage coupled with a chemical which irritates the scalp and so speeds up the blood supply to the roots.

For the same reason, doctors can sometimes cure baldness when it is the result of a disease of the scalp. And when baldness is a symptom of a disease which affects the whole system —like typhoid or radiation disease—it often cures itself.

But no one has yet found either the cause or the cure of premature male baldness. Experts know that it is not caused by overtight hat-bands or washing the hair too frequently, and that it cannot be cured by suction-cups or hair-restorers.

They agree that it is usually associated with greasiness of the scalp and the thick, yellowish type of dandruff to which fine grey-type dandruff may lead. Heredity plays a large part in this greasiness and so do the male hormones. That is one reason why women rarely go bald.

Although there is no known cure, treatment—from a qualified doctor and available under the National Health Service—may retard the progress of baldness. So will weekly washing with a mild soap and a daily massage with the tips of the fingers. Regular exercise and a diet low in fats and starches will help to reduce the greasiness. But once the roots have died, there is no possible way of bringing back the hair.

Eighteen months ago, Dr. John Kelvin of Glasgow wrote a letter to the *British Medical Journal*. For two patients suffering from cramp, he had prescribed a new drug called Ronicol. Both reported that the tablets had cured their cramp and that hair had incidentally grown on their previously bald heads.

The daily press reported his experience. Next morning, one newspaper carried a headline: BALD MEN START A RUSH ON THE CHEMISTS. Three doctors at Stoke Mandeville Hospital, Bucks, decided to put Ronicol to a scientific test.

Taking 112 healthy bald males, they divided them into two groups. For one group they prescribed Ronicol four times a day, for the other identical tablets of an inert substance. The patients had no idea whether they were taking Ronicol or not. After three months, the doctors were unsatisfied. They continued the experiment for another three months. They then reported: "We conclude that the drug, given as described, has no effect on the growth of hair."

Bald men should not worry. More than half the men in middle-age are bald or losing their hair. Anthropologists say that human beings no longer need their hair to protect them from cold or injury and that baldness is just one more stage in their evolution from ancestors who were completely covered with hair.

With the possible exception of some women, who as a sex have delayed the process by greater care of their hair, no one will have any hair at all in half a million years' time. THE END

OPEN TO VIEW

by JAMES LEES-MILNE

Drawn by ROWLAND HILDER

Roughly carved initials on the stones of Bateman's recall a great man's heartbreak

In 1902 Mr. and Mrs. Rudyard Kipling bought a house called Bateman's at Burwash in Sussex. When all was signed and sealed, the seller said: "Now just tell me how you propose to get over these steep hills to and from the station?"

"I shall use this machine," Kipling replied, proudly pointing to his Locomobile motor car. The seller roared with laughter and said: "Oh, those things haven't come to stay."

Bateman's, now owned by the National Trust, is an old stone manor house built in 1634 by a wealthy ironmaster. Before the great coalfields were worked, charcoal was used to smelt ironstone in the Sussex Weald. With the passing of the industry to the Midlands, the ironmasters' homes around Burwash became humble farmhouses.

In 1902 Bateman's was just the sort of house that scared servants, always prone to see ghosts by oil lamp or candlelight. So the Kiplings decided to install electricity. Sir William Willcocks, the great engineer who had designed the Aswan Dam on the Nile, harnessed the waters of a mill pool in the garden to a turbine, and laid a disused seacable from the mill to the house.

For over thirty years Kipling made Bateman's his home. He formed the garden out of an orchard, planted the yew hedges and filled the house with antique furniture.

There he wrote most of his later books, including *Rewards And Fairies* and *Puck Of Pook's Hill* — the hill itself is visible from the lawn, looking west. There he entertained his host of friends. Rider Haggard was perhaps the favourite and the two authors would work in the same room and even share each other's plots.

On the left side of the Jacobean porch, roughly carved in the stone, are the initials of Kipling, his wife and his only son, whose death in the first World War was a terrible blow. The iron bell-pull once hung before the London house of his uncle, the painter Burne-Jones, where he had spent many happy days of his boyhood. Years later Kipling hung it at his own door, "in the hope," he wrote, "that other children might also feel happy when they rang it."

How to get there: Bateman's is half a mile south of Burwash. Nearest railway station: Etchingham (S.R.). *Open:* Wednesdays, Saturdays and Sundays at these times: March to October, 2 till 5; November to February, 2 till 4. Also Easter Monday, Whit Monday and August bank holiday, 11 till 6; Good Friday, 2 till 6.

Colour on the wing

Continued from page 21

budgerigar breeder break even in his hobby."

Will Addey became secretary of the Budgerigar Society in 1945 when the membership was less than one thousand. Now there are more than twenty-six times the number of members and every week he receives scores of applications.

The society has a full-time staff of nine, a yearly income of nearly £20,000 and a complex system of cross-filing which carries the code numbers and breeding records of every member all over the world.

At fifty-two Addey has turned the family business over to his sons and gives his full time to budgerigars. Two years ago, believing that the world looked to Britain for a lead in budgerigar breeding, he organized the first World Budgerigar Convention at a cost to his society of £3,000. Held in Harrogate, it drew two thousand fanciers from all over Britain and the Continent; a score or so came from the U.S. and Canada and one fancier flew from Hongkong.

It was after this budgerigar jamboree that Addey was invited to America, where budgerigar breeding is more commercial than in Britain but less successful in terms of standards. Everywhere people commented to him on the excellence of the few English birds they had seen. "We could export thousands of budgies to America," he says, "but their government won't let us because it fears psittacosis, the parrot disease which, to our knowledge, cannot be transmitted by budgerigars." Scientific authorities, however, are not prepared to exclude the possibility.

At one show, at Chesterfield, Indiana, Addey worked thirty-six hours without a stop because exhibitors of the 1,400 budgerigars, some of whom had travelled 1,500 miles to be present, all wanted his personal verdict. In one town, he and his wife were received to the tune of "Land Of Hope And Glory."

Nowadays Addey rarely has a chance to show his own birds since, during the British show season lasting from August to February, he judges an average of one show a week in different parts of the country. He applies the society's strict standards. "The bird must be in good shape with tight feathers and wings well down on the body," he says. "The head must be nicely rounded, the back straight and the bib should have six spots but show only four of them completely."

Budgerigars are temperamental creatures, and they often refuse to perform before strangers.

For a talking class in the world championship in Derby last year, Addey installed a tape recorder and a microphone in a room and relayed the sound to loudspeakers outside. Exhibitors were shown in one by one and remained alone with their bird for a few minutes behind the locked door. The judge stood outside and listened to the loudspeakers. It worked perfectly: out of forty birds in the class only one remained silent.

But these oddities of the budgerigar would no longer surprise Addey. He recalls the arrival some years ago of the first albino budgerigar ever seen in Britain.

The bird was completely white without a trace of another colour. The breeder, young and inexperienced, explained to Addey that an old-timer had told him that wetting newly hatched eggs often helped the youngsters to leave the shells. He did that, but accidentally dropped that particular egg in a bucket of hot water he had used to clean his aviary.

Addey says: "For months afterwards, thousands of breeders up and down the country hopefully dropped their eggs in hot water. Not a single albino was produced. We eventually proved that the hot water had nothing to do with the birth of the albino. Just sheer coincidence. It just goes to show that with budgerigars you never can tell." THE END

"DELIGHTFULLY SHOCKED!"

FOR eighty-year-old Mrs. M. Dean (2 Cilcen Grove, Acton, Wrexham) a telegram arrived one recent Wednesday. "Delightfully shocked!" she replied to that *Bullets* £500 First Prize news.

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(Each winner from £50 to £5 receives also a Camera.)

For ten winners of £2 10s. plus Camera, see *"Bullets" Bulletin*. 50 Special Awards and 1,000 "Good Shot" Prizes have also been posted.

RULES 1. First Prize for best *Bullet* received. Others in order of merit; the test is of cleverness, aptness and originality.

2. Editor undertakes that all *Bullets* received shall be accorded careful consideration by competent adjudicators.

3. As entry-fee enclose P.O. as indicated on coupon. Fee submitted will be taken to cover *Bullets* in coupon order—any sent in excess will be disqualified. Plain-paper entries are allowed. Make P.O. payable to JOHN BULL, cross /& Co./, write name and address on back. Coupons must not be mutilated.

4. Entries accepted by post only and on condition that result of this Contest (in JOHN BULL dated July 14), also Editor's decision in any matter of dispute, are accepted as final and legally binding. Odhams' employees (and families) ineligible.

(See "Daily Herald" on Saturday, June 30, for early news of No. 2,043 result.)

POST ENTRY "Bullets" 2,043, "John Bull," Long Acre, London, W.C.2 (Comp.).

Next week: HUGE EUROPEAN TOUR OFFER

When your job gets on your nerves

You know those mornings when you feel you just can't cope with a day's work. You feel irritable and depressed. You can't concentrate. You worry. Your mind refuses to work. You just want to go back home to bed.

That's the time to take a couple of Yeast-Vite tablets. Try them. See how quickly they make you feel better. How efficiently they soothe your nerves and give you confidence. Make you feel you can carry on. Try Yeast-Vite for yourself next time you need a pick-me-up.

YEAST-VITE
The Lightning Pick-me-up
TABLETS

Why **YEAST-VITE** *acts so fast*

Yeast-Vite contains three vital ingredients; ***phenacetin*** *to soothe your nerves, disperse headaches and relieve rheumatic pains;* ***caffeine*** *to give an immediate 'lift'; and, to build up vitality,* ***yeast*** *—the perfect natural source of Vitamin B.*

1/9 and 4/- a bottle

YV12 'Yeast-Vite' is a registered trade mark

CLEAR UP BAD SKIN FAST!

New Balm's amazing action

MILLIONS of people are suffering needlessly from the pain and embarrassment of spots, pimples, eczema and rashes. These and many other skin troubles can now be healed, often in only a few days.

What causes these troubles? Germs which breed under your skin.

No single antiseptic can kill the whole wide range of these germs.

That's why new Valderma Balm contains *two* powerful antiseptics. This amazing creamy balm heals this way: The two antiseptics penetrate deep under your skin in the specially emulsified healing oils. Then, because Valderma Balm is non-greasy and non-clogging, septic matter isn't sealed in: it can escape. Irritation ends.

Your skin trouble quickly vanishes. The skin is left clear, healthy. Valderma Balm at chemists: tubes 2s. 0d., jars 2s. 6d.

For clear healthy skin use Valderma BALM and SOAP

A HEALTH AND BEAUTY HINT

A Special Word to Women

If women only knew how careful they ought to be if they want to keep well and healthy and retain their looks, how much better they would be.

That's why all women ought to know about the Juno-Junipah which more and more women are using every day.

Juno-Junipah is different from ordinary salts. It contains pure oil of Juniper. And it is gentle. It clears away, without any drastic purging, impurities from a woman's system. It keeps her complexion clear and fresh and helps to ward off Sick Headaches, Bilious Attacks and Rheumatic troubles like Lumbago and Sciatica.

Just try Juno-Junipah! You'll be surprised how soon you begin to feel better and look better, too. Your aches and pains will be relieved, your complexion and looks will improve, and you'll look and feel years younger.

If you prefer, the Juno-Junipah formula has been adapted to make pleasant little tablets. Ask your chemist for them.

CORNS

CALLOUSES · BUNIONS · SORE TOES

Dr. Scholl's Zino-pads immediately stop pain by cushioning tender spots on the feet. Give instant relief from corns, callouses, bunions. Lift shoe pressure from new or tight shoes. No other method so effective—so simple. Medicated disks included, loosen corns, callouses for easy removal. Get Dr. Scholl's today from Chemists, Shoe Dealers and Stores everywhere or from all Scholl Depots. 1/1 and 2/- packet.

For callouses

For bunions

Dr Scholl's Zino-pads

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Sweet lovers pick Pascall

Pascall

pick-of-the-fruit sweets

LOOSE OR IN GAY NEW CARTONS